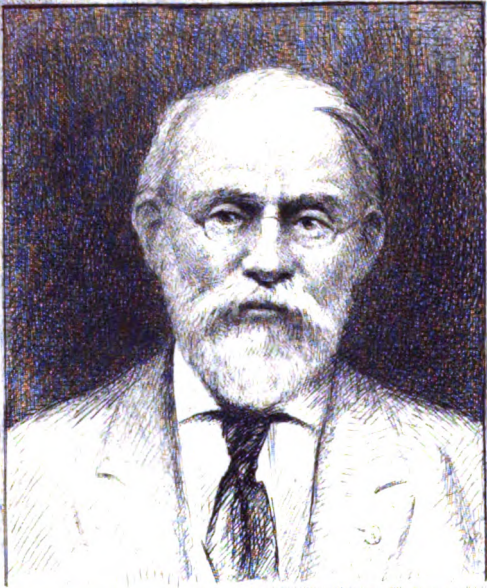

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N O T I C E.

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The Secretary will be happy to send an Index to volumes I, II, III, IV, V and VI to any member wishing for the same.

A. D. ANDERSON, CAPT., R.A.,
Secretary.

ORIGINAL PAPERS.

I.

VARIOUS DESCRIPTIONS OF TRANSPORT,

BY

BREVET MAJOR G. A. FURSE, 42ND ROYAL HIGHLAND REGIMENT,

(*Concluded from No. 34.*)

DISPOSITION OF THE TRANSPORT

OF AN ARMY UNDER THE VARIOUS EVENTULITIES LIKELY TO
ARISE DURING A CAMPAIGN.

The ancient Romans, fully recognizing what an obstacle to their military operations was the large train that usually followed their armies, gave it the very appropriate appellation of *impedimenta*.

It must be apparent to every one what confusion would reign in a column several miles in length of carriages of different descriptions, and pack animals of all sorts, where the want of well defined regulations and the absence of the necessary supervision had failed to infuse order and regularity.

A proper organization of the whole Transport Train will do much in imparting order in this long moving mass of vehicles and animals. Hence it is that we commence by procuring good wagons, young and powerful animals to draw them, and strong, serviceable harness, to prevent any break-down on the way. We divide the whole into certain easily manageable fractions, to obtain more readily the supervision so much required. We mark every ambulance, wagon, carriage, &c., with the number of the division, regiment, or branch of the service it belongs to, to help readily in recognizing to what part of the army the various fractions belong. These and such-like steps are taken before the troops actually go into the field, but this is not enough; there are other important considerations that have still to be taken into account, such as the position of the various parts on the line of march, the whereabouts of the same during the progress of an action, and the orders necessary regarding its movements under certain circumstances likely to arise on service.

As a general rule, the arrangements of the transport train on the line of march depend entirely on whether the army is likely to become

engaged with the enemy or not. Some portions of the transport, such as the reserve ammunition, field hospitals, and bearer companies will be required during the course of an action; these must therefore follow close in the rear of the Army when an engagement is imminent. When no such probability exists, then the movements of the train will be made subservient to the convenience of the troops; but in all cases where an engagement is likely to ensue, the safety of the transport train, and the keeping clear of all the roads by which reinforcements may have to move up or troops retire, must be the principal points to attend to.

The Staff being well informed as to the state of affairs, from the reports of the cavalry covering the front of the army, will be able to assign the proper place to each portion on the line of march. The orders will specify the various parts to accompany the troops, and the order in which they have to follow, the interval of time that must elapse before the other portions are to be put in motion, and how far they are to proceed; in some cases, as for example when an army is retiring, how long before the army moves off the transport train should leave camp.

The heavy portion of the provision columns, artillery parks, pontoon trains, &c., would seriously hamper the rapid movements of an army were they always to move with it; these should be separated from the troops, and move independently, somewhat in the rear. It can do no good, this portion of the train being always with the army, and it will suffice if it joins the main camp during the periods of halting.

An army may occupy a position in which it is desired to await an attack from the enemy. As the issue of the fight will be doubtful, and the troops may have to retire, one of the first precautions in such a case would be to get the baggage and transport train safely out of the way, and clear the ground and roads of all encumbrances. The train should be sent to the rear betimes, and need only be kept so far away that it can be easily brought up when required again. In this and the following cases the reserve ammunition, field hospitals, and bearer companies must remain in the vicinity of the troops, as they may become necessary during the course of a battle.

An army may be in retreat, or such a movement may be contemplated on the approach of the enemy; the transport train in this case would also be moved to the rear, in such time as will allow of the roads being cleared for the columns to follow without loss of time. Should the retreat only be intended if the enemy displays superior forces, or shows a desire to bring on an engagement, and neither of these eventualities comes to pass, the train can be made to rejoin the troops late in the course of the day.

An army may advance to attack, or it is expected to fall in with the enemy on the march; the safety of the train, and the advantage of keeping the roads free of encumbrances, will in this case be best obtained



by the transport train remaining parked in the last encamping ground, or at some place in the rear, ready to move forward when ordered to do so.

When two armies are fronting each other, one may receive large reinforcements, and attack when such a movement was least expected; in such a case the attacked would have to move forward to oppose the enemy, whilst the train is put rapidly in motion and removed from the field of battle. As a general rule, when armies are in such vicinity to each other that an engagement is likely to be brought on at any moment, it will be always prudent to keep with the army only so much of the transport train as is indispensable, and this small portion can easily be withdrawn when it becomes necessary to do so.

When an army makes a flank march in the vicinity of the enemy, the transport train should conform to the movement by marching by some parallel road a few miles on the protected flank.

The ammunition reserves must follow the troops as closely as possibly without coming under the enemy's fire, and should be placed in rear of the centre of their respective corps or divisions. The transport train has no business on the field of battle; there it will be uselessly exposed, and will be a hindrance if the army has to fall back or take up a position in rear. Its proper place is far in rear of the reserves, parked, and ready to follow the troops if they advance, or to precede them and clear their way if they retire. There should always be a small force detailed for its protection and the maintenance of order; for these purposes the baggage guards generally detailed and the military police should suffice. The field hospitals and the bearer companies must follow the troops; the first are halted in the places the medical officers select as most suitable for the reception of the wounded; the second must move still closer to the front, and follow in rear of their respective corps, divisions, and brigades, ready to receive the wounded and convey them to the field hospitals.

With regard to the regimental reserve ammunition and entrenching tools, these should always march in rear of their respective regiments when an engagement is imminent. The regiments may be moved off the main road at any moment after coming in contact with the enemy, and in a wooded or difficult country the reserve ammunition and tools might never rejoin them if once separated. When there is no chance of an engagement they would do better in the rear, all in one group in front or rear of the baggage of each brigade.

Occasions may often occur where it is found necessary to have the minimum of baggage wagons with the troops; the distribution of equipment and light baggage by double companies and squadrons in such cases would hardly be found to work well. It seems preferable to have

the camp kettles,* officers' mess things, regimental books, papers, &c., in one wagon, as these articles are always necessary, and cannot be left with the baggage in the rear without causing some inconvenience. The same with the maps, books, correspondence belonging to the general officers, and those of the Staff, which are always required after a march.

It should be a rule, strictly enforced, that no more horses or animals than are allowed by regulation are kept with the army, and that the animals and wagons are only used for the purposes for which they are intended.

The recent improvements in the arming of the troops and the increased care bestowed on the soldier have augmented the transport of armies. The use of breech-loaders has augmented the amount of ammunition to be carried in the field; with the new arms originated the use of shelter trenches, which demand that a supply of entrenching tools should be always kept with each regiment on service. The number of guns employed in the field has also increased, and with them the number and size of the ammunition reserves. The operations being more rapid than they were formerly, the infantry soldier cannot be over-weighted, and in some cases his kit has to be carried for him. The relief and care taken of the wounded has likewise received, as it justly demanded, a great impulse; but with this the number of ambulances, carriages, and other means of conveyance for medicines, hospital comforts and appliances, have also augmented. Notwithstanding all this, the importance of continually studying how to diminish the train to render an army more moveable has not altered. It is an incontestable fact that the greater the wants of an army the less moveable it becomes; to bring a war, therefore to a speedy and successful termination, an army must possess as much mobility as possible, and this can only be obtained by reducing its train as much as the efficiency of the army will permit.

If we examine the line of march of a division previous to an engagement, we shall find first the fighting portion, divided into advanced guard and main body, the small-arms ammunition wagons and tools carts in rear of their respective regiments. Then follow still further supplies of ammunition for artillery and infantry in the second line of artillery wagons and infantry and artillery reserves. This forms the fighting portion of the column. The wounded and the sick require attention next; hence the field hospitals and ambulances follow in rear of the fighting men, after which comes the light baggage, comprising the articles actually indispensable for the maintenance of the men and animals for the day, and for the work which has to be carried out. The remainder of the Transport Train is devoted to the heavy portion of the impedimenta, the heavy baggage, provision columns, siege train, pontoon

* Some alteration in the pattern of the Flanders kettles now in use, which would permit of their occupying less space, would be a great improvement. The camp kettles used in India are very heavy, and require continual tuning; this adds considerably to the first cost, which is very high. Two mules or a camel are necessary for the conveyance of the cooking utensils of each company on the march.

train, bakery and butchery columns, telegraph, post office, &c.; these must remain parked in rear until the result of the fight is ascertained.

On the other hand, when an army marching is only moving from one position to another, either with no enemy in front or with no chance of bringing on an engagement, the small-arms ammunition and tool carts and the ammunition reserves can be placed with safety further in rear, and the baggage, both light and heavy, provision columns, stores, &c., can be further advanced in the order of march, to permit of their coming into camp early in the day. The heavy portions of the train can best march at night, when, generally speaking, the roads will be clear of troops.

In hilly countries, where defiles and passes are abundant, about two-fifths of the troops should march in front, preceded by an advanced guard; a fifth moving with the convoy and the remainder closing up the rear.

Intimately connected with the transport of an army are the officers detailed as Baggage Masters. These officers regulate the assembly and formation of the impedimenta in accordance with the orders they receive from the officers of the Quarter Master General's Department and are responsible for its order, regularity, and discipline during the march. Baggage Masters have nothing directly to do with the efficiency of the means of transport, which is the principal duty of the Transport Officer, but they supervise on the march the entire train of their respective Army Corps, Division, or Brigades, and are specially appointed to guard against the conflicting interests which would be sure to arise if there was no supreme head to take the direction of its component parts.

The Baggage Masters should be active, intelligent, and strict in the execution of their duties, without which qualities they would be unable to enforce their authority on the class of men they would have to deal with, often not the most amenable to discipline.

One should be detailed for each Brigade, Division, and Army Corps their army rank increasing with the importance of their charge, and, irrespective of seniority, their orders, as far as it regards the baggage, must be paramount.

The Staff Officers will issue their orders to the Baggage Masters regarding the place of rendezvous, the order of formation, the strength and composition of the baggage guard, the hour of starting, the road to follow, the destination of the baggage, and any other dispositions that according to circumstances may be necessary. In a Division, the Brigade Baggage Masters will take their orders from the Divisional, in an Army Corps, the Divisional Baggage Masters will in the same way be under the direction of the Army Corps one.

Each Baggage Master should have a steady mounted Non-commissioned Officer to assist him in his duties.

The Military Police are generally placed on the line of march with the baggage; any men committing themselves, or disobeying the orders of the Baggage Master, should be at once handed over to their custody, to be dealt with by the Provost Marshal. The Military Police, however, are with the baggage only to keep order, and in no way to form its escort.

The impedimenta in charge of Baggage Masters comprise all the wagons and pack animals that are attached to Brigades, Divisions, and Army Corps for the conveyance of the sick, baggage, provisions, and war material; all the carriage, in short, which does not find a place with the fighting portion of the column.

The baggage is generally formed up by brigades on their respective assembly grounds, and may be moved off to the divisional ground, if considered necessary, before being put in motion.

The usual order of march for the baggage of each Division is as follows:—

Baggage of Head Quarters of the Division.
 Baggage of Divisional Cavalry Regiment.
 Baggage of Head Quarters, 1st Brigade.
 Baggage of 1st Brigade, in same order as Regiments in the Column.
 Baggage of Head Quarters, 2nd Brigade.
 Baggage of 2nd Brigade, in same order as Regiments in the Column.
 Provision Columns.
 Stores and *Matériel*.
 Field Hospitals.

One or more companies of Infantry and a detachment of Military Police close up the rear.

On the march the Baggage Masters see that all the carriages and pack animals keep their proper place, that the drivers and men of the escort do not quit the column and do not molest the inhabitants, that no gaps are formed, and all breakdowns receive prompt assistance; in all of which duties they must be assisted by the Transport Officers. In short halts the baggage should remain in column, all drivers dismounting; in those of any length it may be parked to allow of the animals being unhooked and rested.

In crossing a bridge or defile or passing through a village or town, Baggage Masters must place sufficient guards for the maintenance of good order and the prevention of unnecessary halts.

On approaching the camp or bivouac it will be as well to make a short halt to get the baggage in perfect order, to remove any unauthorized animals or wagons from the column, and correct any other irregularities; after which, according to the instructions the Baggage Masters have received, the baggage will be either parked or the several portions

will be directed to move forward and rejoin their respective regiments, head quarters, or departments.

At the conclusion of the march the Baggage Masters should report to their respective Staff Officers, giving an account of the march, with a statement of any irregularities that have been committed, reporting any arrests that have been made, and detailing any other occurrences which may have come under their observation.

CONVOYS, PARKING WAGONS, AND FORMATIONS,

IN CASE OF ATTACK.

In column of route the wagons or carts follow each other in succession with an interval of four yards. The pace of all transport is the walk; the strictest attention should be paid to follow the rule of the road, and, except when the breadth of the roads will admit of it, or it is desirable to shorten the length of the column, no two carts should ever move abreast.

A convoy, or a division of the transport, is parked when the wagons or carts are all ranged in an orderly mass, generally in successive parallel lines, according to some established plan. The animals are unhooked, and are picketed, generally speaking, in the vicinity of the carriages they have to draw.

The most convenient manner of parking is to form up the lines of wagons at such a distance from one another as will permit of the animals being picketed in the intermediate spaces (Fig. 1). In this way the animals can be harnessed and put to in the shortest time.

The defence of convoys does not properly form part of these studies, but their formation in cases of attack demands to be clearly understood. Convoys moving close in rear of an army, being generally protected by the position of the army in front, will seldom demand a special escort; a sufficient force to insure order and to attend to matters of police being all that will be required. When they are, however, moving exposed to an attack from the enemy, or through a disaffected country, they require an escort of sufficient strength, under charge of an officer of ability. Those composed of powder and ammunition require stronger escorts than those of provision and stores, to keep the enemy further off the convoy during an attack.

The Officer Commanding the escort is entrusted with the charge of the convoy, and any officers marching with it, though of superior rank, have no right to interfere with his command. On the eve of departure all that is to form part of the convoy should be assembled and parked outside the town, fort, &c.; and a minute inspection should be made by the officer in charge to ascertain that everything in his charge is present; that the animals, harness, wagons, &c., are in good order; that a certain number of spare wheels, shafts, tools, and other articles to repair damages on the road, have been supplied; that no sick drivers or animals are present; if forage is to be carried, that it is there and properly distributed; in short, that everything is in the best possible order.

On the march, where pack animals and wagons both form part of a convoy, the first should be placed in front. Generally speaking, the

articles in a convoy will be placed in the following order: Ammunition, treasure, provisions, military stores, officers' baggage, suttlers' and merchants' carts. No unauthorized animals and carts can be permitted on any account to join a convoy.

Any carriage becoming disabled on the way must be drawn on one side and repaired; after the repairs have been executed it will take its place in the rear of the column. When a disabled wagon cannot be put in a fit state to proceed any further, it must be removed to one side to clear the road, and, if possible, should be replaced by one requisitioned from some village in the neighbourhood, otherwise the contents must be distributed amongst the lightest loaded of the other carriages; the horses being made over to the carriages most in want of them.

On the appearance of an enemy, greater attention must be paid to the drivers of requisitioned transport; for, serving, as they often do, against their will, they will try in the confusion of an attack to cut the horses' traces and save themselves, leaving the carriages without horses at the very time when the motion of the march should increase.

In cases where noise may point out to the enemy the whereabouts of a convoy, the drivers will be strictly forbidden to sing, or even to crack their whips. In countries where people are hostile, it will be always prudent to park a convoy far from inhabited localities; this should be the rule when the convoys contain ammunition or other combustible materials. The injunctions against smoking with these last should be frequently repeated and strictly enforced.

It will take about half an hour for about fifty carts to get into movement, so that in a large convoy the animals should be harnessed in succession. When the roads admit of it, two wagons can move abreast; to admit of this, the road must be broad enough to take three wagons besides the intervals of three feet between the axles of each two. This formation is assumed when it is desired to shorten the length of a convoy; but in crossing bridges and moving through villages this breadth will be found generally wanting, consequently there will be loss of time in resuming the single column. Still, where for a long space of time the double formation can be maintained, the advantage of shortening the length of the convoy should not be neglected.

A convoy, or division of transport, may be attacked on the march, in which case certain formations are necessary to ensure its safety, whilst the men entrusted with its protection repel the attack and drive back the assailants. Always on the enemy appearing in sight a careful examination should be made to ascertain if he is in a state of attacking with forces superior to the strength of the escort. The points every commander of a convoy must keep in view are to conduct the convoy entrusted to his charge safely to its destination, to avoid if he can an engagement with the enemy, and only to halt and park as a last

extremity.* If the enemy is not strong, the march should not be delayed, but if he is in superior numbers and the march cannot be continued, it may be necessary to adopt one of the following formations.

The best formation to assume is that of a hollow square, the wagons and carts being ranged on the four sides, the interior space being occupied by the animals and drivers. In this formation, the wagons ranged axle to axle (Fig. 2) will form a very strong barrier; should the interior space be too limited, the wagons and carts may be ranged end to end (Fig. 3), a formation that will afford very much more room, though the barrier will not be so strong. On occasions there may be no convenient space at hand to form up in this order; then the wagons or carts should form in two lines end to end, and close up (Fig. 4), the animals being taken out and placed between the lines.

With two-wheeled carts, ranged axle to axle, the shafts should be turned towards the interior of the square. If they are ranged end to end, the shafts of each should be secured under the body of the cart in front of it. In both cases one or more openings must be left on each face to allow ingress and egress, but each opening should be secured by a wagon placed across it and a little in rear, to act as a traverse.

There will be great disorder in a convoy suddenly attacked by cavalry. The enemy's troopers will endeavour to cut the traces, and even hamstring the animals; it is therefore in such cases most necessary to attend first of all to the safety of the animals. The quickest and best disposition to take is to form a double line of carriages facing inwards (Fig. 6), a formation that will permit of the column of route being resumed in the shortest space of time.

All these formations in case of attack are, however, dangerous when the articles in the wagons and carts are powder or combustible stores; in this case, the best that can be done is to park the carriages in one mass (Fig. 5), and remove the animals and men to some place close by, where they will be safe in case of explosion, there to wait until the attacked is repelled.

As soon as the enemy is repelled the march should be resumed. This must be done with caution, as the enemy may wish to show he is retiring from an attack only to be able to renew it with advantage as soon as the convoy is again in motion. The best way of attacking a convoy is to take it by surprise, particularly in a defile; great care must therefore be observed when approaching one of these places, and parties from the escort should move forward and search the ground thoroughly.

Arriving towards the end of a march at a village or defile which will have to be crossed the following day, a convoy should always be encamped on the furthest side of these, for it is best to issue from these difficult places while the convoy is already moving onward in an orderly formation.

* It takes a long time to park wagons, and generally more than a strong enemy is inclined to give.

DUTIES OF TRANSPORT OFFICERS.

A new corps, like a transport corps, raised generally at short notice, will only in course of time perfect its organization and become thoroughly disciplined. This time is often wanting, for the operations may not extend over a few months; the corps therefore requires at starting a few clear rules for the guidance of its officers and men, to reduce as much as possible the confusion which is sure always to arise where officers and men are brought together to undertake duties to which they have not been accustomed.

The following might, in the absence of any others, form a basis to work upon, until a code according to the circumstances of the case is prepared.

Officers in charge of divisions are responsible for the entire efficiency of their divisions, with respect principally to the health of the men and cattle; rations and forage; serviceable state of harness, saddlery, wagons, and gear; discipline in camp and on the line of march; regularity of duties, and punctuality in the hours of departure.

When detailed for duty with the different departments of the army, the supervision of their divisions is their special care. They must readily comply with the instructions they may receive from the officers of the department they are attached to, with regard to the stores, &c., they are to convoy, and their destination. They must cultivate a cordial understanding with the officers of the different branches of the army, as petty jealousies and quarrels can only obstruct the smooth and efficient working of the various departments, so very essential on active service.

No animal should be worked immediately after disembarkation. Animals after a long sea journey must be allowed to recover their strength gradually.

All animals for the Transport Corps should be branded—horses, mules, and ponies on the near fore arm, camels and bullocks on the near haunch—and a register should be kept by officers commanding divisions of all the animals, wagons, saddlery, gear, and other public property in their charge.

The saddle and harness should be separately fitted to each animal, and once fitted never changed. No animal with the slightest back or girth gall, or lame, should be used; all these should at once be turned over to the care of the farriers.

Sick men and animals should be sent, as soon as an opportunity offers, to the sick depôts; a roll showing when the man was last paid and rationed, and articles of public property with men and animals, should

be delivered to the dépôt officers. Animals suffering from infectious diseases should be at once isolated.

Officers of the transport are answerable that nothing but the weight according to the scale established for each description of transport is carried, for which purpose they should be either furnished with scales and weights, or the weight of all loads and packages should be marked on them. The drivers should never be permitted to ride on the loaded animals, and no one should ride on the wagons but the persons duly authorized to do so. Proper care should be taken that the carriers and animals are never unreasonably overweighted or hurried on the march, as this will most likely seriously affect their carrying powers for the future. It should be borne in mind that, under excitement and urged by appeals of a higher nature, men can be got to double their exertions, but that this power does not extend to animals.

Commanders of divisions should report if the scale of loads, owing to insufficiency or inferior quality of forage, the length or difficult nature of the marches, or the nature of the country and climate, appears to be in excess of the power of the men and animals with due considerations to their future efficiency. Though bound to see that each animal carries or draws the load as laid down in the scale, he should, with the written concurrence of the senior officer on the spot, reduce the loads if he has good grounds to believe that, owing to any particular circumstance, these are too great.

Officers of divisions must hold their subordinates responsible for the efficiency and good behaviour of their respective squads, and should ascertain by frequent inspections that the articles of equipment and gear are in serviceable order, and that all repairs are quickly and well executed.

The subordinates should inspect the girthing of saddles and harnessing of the horses before the animals leave the lines.

The officers and non-commissioned officers must pay particular attention to the line of march; carriers, pack animals, and wagons should move in an uninterrupted stream, with proper intervals but no gaps, conforming to the rule of the road. The senior officer will always march in rear of his charge, leaving the lead to be taken by the next senior. Animals that die in camp or on the line of march should be removed some distance from camp or from the main road, and, if possible, buried. Officers should report, at the end of each day's march, on the state of the roads they have marched over, pointing out where repairs are necessary. This is particularly necessary in staging operations.

Everything conducive to the health and comfort of the men and animals should be attended to. The officers should see that the men erect proper shelter for themselves; and, where there is abundance of

material and the inclemency of the weather demands it, temporary stables should be erected for the animals.

The sooner the animals are fed and groomed after arrival in camp the better; if there are not sufficient men to unload wagons, &c., the carts should be parked and the animals taken out, and the unloading can take place afterwards. Saddles should not be removed until the expiration of an hour after arrival in camp, that the animals may get gradually cool.

An immediate report of any falling-off in the quantity or quality of the rations and forage should be made, and officers commanding divisions must inspect both rations and forage daily. When in the lines, the animals should be fed three times a day; viz., after morning stables, again at 12.30, and after evening stables at 6.30 p.m. On the march the hours of feeding must vary according to circumstances. The animals should eat their corn out of the nose bags, and not on the ground, as a good deal of grain will be wasted if proper attention is not paid to this. The animals should be watered in the early morning and again in the afternoon. Before starting for a march, however, little water should be given, and after arrival in camp an hour must be allowed to elapse after feeding before they are watered.

A roll of the men should be called the first thing in the morning and the last at night.

Animals should be groomed before starting and after arrival in camp. This grooming need not be excessive, but such as will keep the animals in good health. Animals at rest should be exercised for the space of an hour daily.

As soon as practicable after the formation of a camp, latrines and refuse pits should be dug, and every attention paid to these sanitary measures. The men should also be made to parade often, to ascertain that they maintain themselves clean; this inspection should be often conducted by a medical officer, to detect disease.

No lines should be left at night without a stable picquet, with sufficient flying sentries, to look after the animals and the security of the public property. A small party should watch over the property in the lines when the division is out. All stable picquets should be provided with lanterns.

Rest after hard work is necessary both for men and animals; strict silence must be maintained in the lines during the night. The hours between which no noise of any kind is to be permitted must be fixed according to circumstances.

The officers must take great care that it is thoroughly explained to the men that looting, pillaging, wanton destruction of property, &c., by camp followers cannot be tolerated. Any complaints against the men

on this score must be immediately investigated, and if they are found correct the men should be delivered over to the Provost Marshal for punishment.

Officers should make themselves acquainted with the resources of the country in means of transport, so as to be able to supply any deficiency when necessary, or increase the carrying powers of their divisions when the necessities of the army demand it. If they can obtain means for feeding their men and animals in the vicinity of their stations, they should communicate the fact to the Commissariat Officers, with a view to a proper contract being made with the people of the place. They should pay the men themselves—weekly is most convenient—drawing the money from the paymaster, and forwarding a monthly paysheet showing all disbursements.

Particular attention at starting should be paid to the harnessing and loading. At every halt (one will take place every hour), and above all at the first, the animals should be re-girthed and have their feet looked at. Whoever leads must maintain always an even pace; the greater the length of the column the slower should be the pace at the head. Without this precaution, which is of great moment, the middle and, above all, the end of the column will experience sudden checks and changes of paces, which if frequently repeated will greatly fatigue the animals. In a mixed convoy of pack animals and carriages the first should always be placed in front, as the carriages often cut up the roads.

During the progress of an engagement the drivers must remain with their divisions ready at a moment's notice to mount and move to the front or rear.

Greater attention and regularity on the march must be paid when the train comes up after a battle, on account of the confusion which always exists in rear of a great battle-field.

Officers in command of a convoy crossing a bridge, or passing through a defile, town, causeway, &c., should never halt their charges until these places have been cleared by the whole column. On arrival at a river or stream, the leader of a division of pack animals must halt and prevent any of the animals from drinking, as the march of an entire column will be delayed by even two or three animals stopping for that purpose.

Officers of divisions should keep a brief journal of the daily work performed, with any necessary remarks: * these journals may be called for at the end of the campaign, to compile a summary of the labours of the corps, necessary for any future expedition.

* They should report daily to the head-quarters of the transport how their divisions have been occupied, the wagons and animals available for duty, and any particulars that it is necessary the Director should be made acquainted with.

The duties of Transport Officers and men on service are extremely arduous; it is not fair, therefore, that rewards should only fall to the more favoured ones who have the good luck to distinguish themselves before the enemy, whilst those by whose exertions and fatigues, unlightened by excitement, the army is brought face to face with him should remain unnoticed. Rewards should be given solely on account of work done towards the accomplishment of the object the General has in view. The exertions of men far in rear may have great influence on the result of the campaign, and Transport Officers on the whole length of the line of communication should be made to understand that their endeavours to forward the object of the General will be justly appreciated.

Transport Officers should strictly confine themselves to transport duties as long as they are attached to this branch of the service, and independent of their army rank must not assume command over any troops in any position whatever. It must be clearly understood that, setting aside the special duties each portion of the transport of the army is told off for, each officer and man is liable for any other duty that the General Commanding may at any time think fit to call him to perform.

ORGANIZATION.

Whatever organization is considered necessary for the transport of an army in the field, the whole detail must be fully prepared beforehand in time of peace. The Director, his staff, the officers and non-commissioned officers for the corps, should be about the first to proceed to the port of debarkation, to set going at once the organization approved by the authorities at home. Selected officers, with veterinary surgeons and accountants, should be despatched without loss of time to the most approved convenient markets (which should have been previously ascertained), to purchase the animals required, all of which, after purchase, should be forwarded either direct to the port of debarkation for the army, or to depôts situated at a convenient distance from it.

As the transport will generally be a new corps, mostly composed of raw and untrained men and animals, it should be the first to be shipped to the port of debarkation, to give it more time to perfect its organization. It should not be lost sight of that its services will be the very first called for.

All articles of equipment which can be furnished by the arsenals at home should be shipped off at once, and no time should be lost in entering into contracts for those articles which it will be deemed preferable to purchase locally.

In the field the Staff of the Transport should be with the army head-quarters; the Director, being under the orders of the Quarter Master General, will be able at all times to furnish him with reports showing how the various divisions of the transport are occupied, receiving through him the orders of the General Commanding with regard to the daily employment of the same.

When the Transport Staff leave the port of debarkation, a small depôt should remain to look after future supplies of animals, carriages, harness, &c., which may arrive to replace or reinforce the transport of the army.

A simple system of accounts, prepared beforehand, for purchasing-officers as well as for those in command of divisions, should be introduced from the very commencement of operations, to account for the correct expenditure of public money. The fewer books that are kept in the field the better, but some, as the following, cannot be dispensed with:—

Register of animals purchased.

Do. of equipment received and issued.

Roll of drivers engaged and discharged.

Casualty book.

Contract book.

Letter book.

Cash account book.

Any forms or returns required, such as pay abstracts,* acquittance rolls, ration and forage indents, states, discharge certificates, should be issued to officers in printed forms, to obviate the necessity of having to write them out on service, which is at times a difficult matter and takes up a deal of time.*

The Staff proposed to work the transport of the army would be as follows:—

- 1 Director of Transport.
- 1 Assistant Director, with Officer in charge of the line of communication.
- 1 Transport Staff Officer.
- 1 Pay Master.
- 1 Quarter Master.
- 1 Veterinary Surgeon.
- 1 Interpreter (or more).
- 4 Clerks.
- 1 Pay Master Clerk.
- 1 Quarter Master ditto.
- 1 Farrier Major.
- 4 Orderlies.

A Veterinary Surgeon is considered necessary for every four hundred horses, and one Farrier and one Shoeing Smith for every fifty.

Transport, of whatever description, must be divided into regular portions, so that no more men, animals, wagons, &c., than can be effectively supervised by one officer, both in camp and on the line of march, may be allotted to each portion.

* Any elaborate returns required for future reference should be prepared by writers and clerks at the base.

The transport attached in the field to the various branches of the service, or detailed for special duties, according to the organization tables issued with Army Circulars of 1st December, 1877, is as follows :—

**OFFICERS AND MEN, HORSES AND CARRIAGES REQUIRED
FOR A DIVISION WITHOUT TENTS.**

	Officers and Men.			Horses.					Carriages.
	Officers.	Non-Commissioned Officers.	Drivers.	Riding.	Draught.	Spare.	Pack.	Total.	
2 Brigades of Infantry with $\frac{3}{1}$ and $\frac{4}{1}$ Secs. of Trans. Co.	8	28	176	20	320	32	...	372	94
One Infantry Battalion ...	1	1	22	2	40	4	...	46	12
One Cavalry Regiment ...	...	1	22	1	40	4	...	45	10
Infantry and Artillery Ammunition Reserve ...	6	85	123	19	214	22	...	255	51
Transport Company R. Engineers ... ..	...	...	26	...	24	4	3	31	6
$\frac{1}{1}$ and $\frac{2}{1}$ Sections Trans. Co.	3	22	89	10	162	16	...	188	61
$\frac{1}{V}$ and $\frac{2}{V}$ Sections ...	3	24	113	10	216	10	...	236	56
Total for Div. without Tents.	21	161	571	62	1016	92	3	1173	290*

* The 30 carriages of Field Batteries moving with the combatants not included.

TRANSPORT REQUIRED FOR A DIVISION WITHOUT TENTS AND FOR ITS VARIOUS COMPONENT PARTS.

	OFFICERS AND MEN.				HORSES.				CARRIAGES.																				
	Officers.	Non-Commissioned Officers and Men.	Drivers.	Total.	Riding.	Draught.	Spare.	Packs.	Total.	General Service Wagons, 4-horsed.	Forge Wagons, 2 and 4 horsed.	S. A. V. Carts, 2 and 4 horsed.	Carts or Light Wagons for Equipment, Stores, Tools, etc., 2-horsed.	Water Carts, 2-horsed.	Ambulance Wagons, 2-horsed.	Surgery Wagons, 2-horsed.	Pharmacy Wagons, 4-horsed.	Supply Carts, 2-horsed.	Wagons' Equipment for purposes, 4-horsed.	G. S. Wagon for Hospital purposes, 4-horsed.	16 Pr., 4-horsed.	9 Pr., 4-horsed.	For Ammunition and 4 horsed.	For Rockets, 4-horsed.	For Stores and Baggage, 4 and 6 horsed.	Ammunition Wagons R. M. L. 6 and 8 horsed.	Total Carriages.		
An Infantry Battalion without Tents.....	1	1	22	46	2	40	4	...	8	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	51
" " with Tents.....	1	1	28	58	2	52	4	...	11	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	51
Section Transport Company for Infantry Brigade.....	1	1	22	48	4	40	4	...	8	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	11
Infantry Brigade without Tents and Section Transport Company.....	4	14	88	186	10	160	16	...	32	1	9	5	5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	47
Infantry Brigade with Tents and Section Transport Company.....	4	14	106	222	10	196	16	...	41	1	9	5	5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	56
Cavalry Regiments without Tents.....	...	1	22	45	1	40	4	...	8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	14
" " with Tents.....	...	1	30	57	1	52	4	...	12	1	1	...	...	...	4	...	...	...	...	...	8	...	...	...	...	...	...	...	24
Section Transport Company for two Field Hospitals.....	2	13	46	98	6	88	4	...	8	...	...	...	...	...	4	...	...	...	...	...	...	...	...	...	...	...	...	...	21
Section Transport Company for Divisional Details.....	2	13	46	98	6	82	10	...	19	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Section Transport Company for Second Day's Provisions and Commissariat Detachment.....	1	11	67	138	4	128	6	...	31	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	32
Bearer Company Transport 1st Line.....	1	9	20	44	4	34	6	...	44	...	...	...	...	...	2	10	2	...	...	...	...	...	...	...	...	...	...	...	17
" " 1st & 2nd Line.....	1	9	43	90	4	80	6	...	90	...	...	...	...	...	2	33	2	...	...	...	...	...	...	...	...	...	...	...	40
" " 1st & 2nd Line.....	1	9	47	98	4	88	6	...	98	2	...	...	...	...	2	33	2	...	...	...	...	...	...	...	...	...	...	...	42
" " with Tents.....	1	9	47	98	4	88	6	...	98	2	...	...	...	...	2	33	2	...	...	...	...	...	...	...	...	...	...	...	...
Infantry and Artillery Divisional Ammunition Reserve.....	6	85	123	255	19	214	22	...	...	...	1	22	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	6
Company Royal Engineers, Transport for, A Division without Tents.....	21	161	571	813	62	1016	92	3	1173	144	6	44	12	6	6	3*	2	...	...	...	...	...	...	...	...	...	...	...	12

* Includes 23 carriages which, when procurable, are to be obtained from local sources.
 + Included in total of fourth column in organization tables.
 † The thirty carriages of the Field Batteries are not included in this table as they move with the combatants.

**OFFICERS AND MEN, HORSES AND CARRIAGES REQUIRED FOR AN
ARMY CORPS WITHOUT TENTS.**

	Officers and Men.			Horses.					Carriages.
	Officers.	Non-commissioned Officers and Men.	Drivers.	Riding.	Draught.	Spare.	Pack.	Total.	
3 Divisions without Tents ...	63	483	1,713	186	3,046	276	9	3,519	870
Cavalry Brigade with $\frac{4}{IV}$ Section Transport Company...	1	14	128	7	230	26	...	263	68
Army Corps Ammunition Reserve	18	255	240	57	384	66	...	507	99
Company Royal Engineers and Field Park	1	9	50	7	60	10	3	8	15
Pontoon Troop R. Engineers	9	182	148	33	184	22	...	239	31
$\frac{1}{2}$ Telegraph Troop ditto.	7	106	66	31	68	6	...	105	13
$\frac{1}{IV}$ $\frac{2}{IV}$ $\frac{3}{IV}$ Section Transport Company	4	35	113	14	168	18	...	200	51
$\frac{3}{VI}$ $\frac{4}{VI}$ ditto ditto	2	22	77	8	148	6	...	162	37
VII. Transport Company ...	5	46	179	18	340	18	...	376	127
VIII. ditto (Reserve)	5	46	224	18	432	16	...	466	112
Transport for an Army Corps without Tents	115	1,198	2,938	379	5,062	464	12	5,917	1,423
Artillery Carriages (not included) ... ..	...	...	...	...	...	...	...	...	150
Total Carriages... ..	...	...	...	...	...	...	...	...	1,573

T PARTS.

	Air Line Wagons to be used.							To be requisitioned.	
	Wire Wagons, 6 horsed.	G. S. Wagons for Owen's (Aldershot) 4-horsed.	Bakery Vans, 2-horsed.	Water Carts, 2-horsed.	Ambulance Wagons, 6-horsed.	Surgery Wagons, 2-horsed.	Pharmacy Wagons 4-horsed.	Carriage for Ambulance purposes, 2-horsed.	Wagons for G. S., 4-horsed.
A Division...	6	10	2	4	23	8
Section tr Cavalry...	1	5	1	...	11	...
4. Sect. T
IV Brigad...	1	5	1	...	11	...
RL Engine
Park w...
R. E. Pom...
Royal Eng 2	6	...	...	...	...	...	...	...	...
1/4 Section	1	5	1	...	12	...
IV for Co...
3/4 Ditto,
IV for Co...
2/4 Ditto,
IV
3/4 Ditto,
IV Caval...
4/6 Ditto,
VI for C...
1&2/7 Two	12	...	...	12	24
thre
3/7	17	...	5	...	...	...	...
4/7
A. C. An
VIII. Com
Army Co 2	6	17	...	37	40	8	24	92	48

Includes for an Army Corps, these move with combatants.

Required for an Army Corps on service. A large trn the line of communication up to the nearest transps.

active service in Europe.

Nothing regarding the composition or strength of the provision columns has been detailed with the above. In the German Army* each Army Corps has five Proviant colonnen, each consisting of—

- 2 Officers.
- 1 Surgeon.
- 1 Pay Master.
- 89 Train Soldiers (2 Non-Commissioned Officers included).
- 1 Farrier.
- 1 Smith.
- 2 Assistant Smiths.
- 1 Saddler.
- 1 Wheelwright.
- 1 Cooper.
- 30 4-horse Wagons.
- 1 do. Reserve.
- 1 6-horse Forge.
- 155 Horses.

Besides these 150 wagons of the Government Commissariat train which are generally attached to divisions and carry 4 days provisions, there are 5 Fuhr park colonnen of 80 hired, bought or requisitioned carts each or a total of 400 carts of the Commissariat park and 600 of the etappen commissariat, generally requisitioned carts to perform the service between magazines or the line of communication.

All the transport details shown in the above tables are calculated to meet the requirements of an expeditionary force sent on active service in Europe. A different organization becomes necessary when expeditions are undertaken in our far away colonies, or in countries deficient of good roads. It would be useful therefore, to determine beforehand what convenient subdivision of the transport might be made applicable to most of these cases. The following divisions appear to possess ample superintendence and a regular gradation of responsibility, and are also

* In the Italian Army the transport for the troops is purely regimental; the Cavalry retain in peace time all the carriages and harness that will be required on service, but not so the Infantry, who receive theirs only when the army is mobilized. Both are supplied with draught horses by the committees charged to collect them in the various provinces of the State. The drivers are taken from the regiments.

Officers commanding Cavalry and Infantry Brigades are furnished with carts, drivers and horses by the right regiment of their respective brigades; each regiment of Infantry of the line furnishes the reserve provision column of the Army Corps it belongs to with 1 corporal, 6 drivers, 3 soldiers, 6 battalion carts, and 12 draught horses, and each Rifle regiment with 1 corporal, 8 drivers, 4 soldiers, 8 battalion carts and 16 draught horses.

The transport of the Head Quarters, Artillery parks (Division and Army Corps), hospitals, provision columns, bakery columns, and administrative corps is supplied by the Artillery Train, supplemented, if necessary, by a Civil Transport. The Engineer Train provides for all the wants of its own corps.

All the transport between the front of the army and the head-quarters of the various Army Corps is performed by the military train, in rear of this by railways, hired and requisitioned carriage.

of such strength as will secure their efficient working in most situations likely to arise on service in difficult countries.

DIVISIONS OF CARRIERS.

<i>Strength of Division.</i>	<i>Equipment required.</i>
1 Commander.	2 ponies and saddlery complete.
1 Staff Sergeant.*	317 suits of clothing.
3 Superintendents.	317 blankets.
12 Mates.	317 number labels.
1 Apothecary.	317 clasp knives and lanyards.
300 Carriers.	1 spring weighing machine.
2 Batmen.	1 set scales and weights for rations.
Interpreters as needed.	1 field companion.
	4 lanterns.
	15 sets arms and accoutrements for superintendents and mates.
	4 tents.

Carriers will generally have their own cooking utensils; if not, they must be provided with them. The men will also erect places of shelter out of the material to be obtained in the country.

As the Staff Sergeants and Apothecaries would join the Transport Corps fully equipped, they have not been taken into account with regard to clothing, equipment, &c., but a riding pony has been included for each Commander and Staff Sergeant.

DIVISIONS OF SICK-BEARERS.

<i>Strength.</i>	<i>Equipment.</i>
1 Commander.	2 ponies and saddlery complete.
1 Staff Sergeant.	48 hammocks, cots, or dhoolies.†
3 Superintendents.	48 sets shoulder pads.
12 Mates.	12 oil bottles.
2 Water Carriers.	319 suits of clothing.
300 Carriers.	319 blankets.
2 Batmen.	319 number labels.
Interpreters as needed.	319 clasp knives and lanyards.
	1 set scales & weights for rations.
	15 sets arms and accoutrements for superintendents and mates.
	2 water carriers' bags.
	4 tents.

Six men are required for each hammock, dhoolie, or swinging cot; a division of the above strength will provide conveyance for 48 sick or wounded, demanding 288 carriers. This leaves 12 carriers for torches at night, and, as in hot climates much of the marching will be done by night, torchmen are indispensable. The men generally make their own torches, either out of rags or of some resinous description of wood; these

* Doing the duties of Serjeant Major and Quarter Master Serjeant.

† Each dhoolie should be provided with a water bottle, chague, or other article to contain fresh water for the patient.

12 torchmen, marching by day, will be useful for carrying food for the remainder, or as extra reliefs, &c. No Apothecary is detailed for divisions of sick bearers, as they will be always attached to some field hospital, and medical aid will generally be at hand. The Medical Department should arrange for the medical officers, hospital orderlies, and cooks for the sick and wounded that may be necessary for each division.*

DIVISION OF PACK ANIMALS.

Pack horses, mules, ponies, bullocks, camels, or donkeys.

<i>Strength.</i>	<i>Equipment.</i>
1 Commander.	2 sets of saddlery complete.
1 Staff Sergeant.	214 pack saddles.
3 Superintendents.	214 salcetas.
12 Mates.	214 tarpaulins. { 7' x 6' for horses, mules and ponies.
1 Apothecary.	216 sets shoes and nails (except for camel divisions).
1 Farrier Major.	216 spare shoes.
1 Cattle Doctor (for bullocks or camels).	216 sets picketing ropes, &c.†
4 Shoeing Smiths.‡	216 sets head gear, nose bags and grooming implements.
2 Saddlers.	216 nets forage.
1 Bugler.	216 sacks corn.
107 Drivers.	216 horse, mule, &c., covers.
2 Batmen.	133 sets clothing.
2 riding and	133 number labels.
214 pack animals (this includes 10 per cent. spare).	133 clasp knives and lanyards.
	107 whips (except for camels).
	15 hunting whips for N.-C. Officers.
	4 lanterns.
	1 set branding irons.
	1 farrier's chest.
	1 field companion.
	4 smith's sets of tools.
	2 saddlers' do.
	8 buckets.
	17 kettles (unless drivers provide their own cooking utensils).
	1 bugle.
	Material for three months' repairs.
	Small supply of stationery and forms.
	1 set scales and weights for rations.

Of the animals two horses are for the Commander and Staff Sergeant, and two pack animals to carry the farrier's chest, field companion, smith's and saddlers' tools. Pack bullocks and donkeys do not require so many drivers as other animals. No Shoeing smiths are

* One Medical Officer is required for about forty sick or wounded; orderlies nurses, cooks, &c., two per twenty men.

† Mules used as pack animals are, as a general rule, shod on the forefeet only but when used in draught it is necessary to shoe all round. A Shoeing smith can shoe about 100 mules per mensem.

‡ The equipment for elephants, mules, camels, and bullocks is detailed in the Indian Commissariat regulations.

required for camel divisions, and the camel and bullock drivers generally repair their own saddles. Two batmen are provided to look after the Commander's and Staff Sergeants' horses.

DIVISIONS OF WAGONS, CARTS, &c., DRAWN BY SIX HORSES OR MULES.

<i>Strength.</i>	<i>Equipment.</i>
1 Commander.	15 sets saddlery complete.
1 Staff Sergeant.	212 do. harness.
4 Superintendents.	32 wagons.
8 Mates.	227 sets picketing implements and gear.
1 Apothecary.	227 horse blankets and surcingles.
1 Farrier Major.	106 driving whips.
4 Shoeing Smiths.	12 hunting do.
4 Farriers.	1 lifting jack, spare linch-pins, and washers.
2 Saddlers, Collar-makers, &c.	136 sets of clothing.
2 Wheelers.	136 number labels.
4 Batmen and Orderlies.	136 blankets.
1 Bugler.	136 clasp knives and lanyards.
106 Drivers.	227 sets horse shoes and nails.
227 Horses or Mules (this includes 10 per cent. spare).	227 spare shoes.
	227 nets forage.
	227 sacks corn.
	20 breast straps.
	32 tarpaulins 10' x 9' if the wagons are uncovered
	1 bugle.
	1 set branding irons.
	6 lanterns.
	1 field companion.
	1 farrier's chest.
	Shoeing smiths', saddlers', and wheelers' tools.
	Wheel grease and material for three months' repairs.
	17 camp kettles
	32 buckets.
	14 tents.
	Supply of stationery and forms.
	1 set scales and weights for rations.

The apothecary, farrier major, shoeing smiths, saddlers, collar-makers, and wheelers can be accommodated on the wagons, their chests and tools being carried in the limber boxes. In staging operations, only the artificers required for hasty repairs on the road will accompany the divisions.

A lantern should always be with the leading wagon of each division, the others divided amongst the rest. Lanterns are indispensable at night to execute repairs and readjust loads. Tents are calculated at 1 for Commander, 1 for Staff Sergeant and Office, 1 for Apothecary, 1 for quarter and 1 for rear guard, 9 for the rank and file.

DIVISIONS OF WAGONS AND CARTS DRAWN BY FOUR HORSES, MULES, OR BULLOCKS.*

Strength.

- 1 Commander.
- 1 Staff Sergeant.
- 4 Superintendents.
- 8 Mates.
- 1 Apothecary.
- 1 Farrier Major or
Cattle Doctor for
bullocks.
- 4 Shoeing Smiths.
- 4 Farriers.
- 2 Saddlers, Collar-
makers &c.
- 2 Wheelers.
- 4 Batmen and Orderlies.
- 1 Bugler.
- 227 Horses, or
- 212 Mules or Bullocks,
and
- 15 Horses.
- 106 Drivers.

Equipment.

- 15 sets saddlery complete.
- 212 sets harness, or 106 yokes for bullocks.
- 48 wagons or carts.
- 227 sets picketing implements and gear, or
picketing ropes and posts for mules and
bullocks.
- 227 nets forage.
- 227 sacks corn.
- 227 horse blankets or covers.
- 106 driving whips.
- 12 hunting whips.
- 1 lifting jack, spare linch-pins and washers.
- 136 sets uniform.
- 136 number labels.
- 136 blankets.
- 136 clasp knives and lanyards.
- 227 sets shoes and nails.
- 227 spare shoes.
- 20 breast straps for horses or mules.
- 6 lanterns.
- 17 campkettles.
- 14 tents.
- 48 ropes and tarpaulins 10' x 9', for uncovered
carts only.
- 1 set branding irons.
- 1 set scales and weights for rations.
- 1 field companion.
- 1 farrier's chest.
- Shoeing smiths', farriers', saddlers', and
wheelers' tools, wheel grease, and material
for three months' repairs.
- Stationery and forms.
- 1 bugle.
- 48 buckets.

DIVISIONS OF WAGONS, CARTS, &C., DRAWN BY TWO HORSES, MULES, OR BULLOCKS.

Strength.

- 1 Commander.
- 1 Staff Sergeant.
- 4 Superintendents.
- 8 Mates.
- 1 Apothecary.
- 1 Farrier Major or Cattle
Doctor.

Equipment.

- 15 sets saddlery.
- 212 do. harness, or 106 yokes for bullocks.
- 96 wagons or carts.
- 96 ropes and tarpaulins 10' x 9', for uncovered
carts only.
- 227 sets picketing implements and gear, or
picket ropes and posts, for mules and
bullocks.
- 227 nets forage.
- 227 sacks corn.
- 227 horse blankets or covers.
- 106 driving whips.
- 12 hunting do.

* A cart with four bullocks will carry a weight of 1600 lbs. ; one with two bullocks, of 800 lbs.

<i>Strength.</i>	<i>Equipment.</i>
4 Shoeing Smiths.	1 lifting jack spare linch-pins and washers.
4 Farriers.	136 sets uniform or clothing.
	136 number labels.
	136 blankets.
2 Saddlers, Collar-makers, &c..	136 clasp knives and lanyards.
except for bullocks.	227 sets shoes and nails.
	227 spare shoes.
2 Wheelers.	20 breast straps for horses or mules.
	6 lanterns.
4 Batmen and Orderlies.	17 camp kettles.
	14 tents.
1 Bugler.	1 bugle.
106 Drivers.	96 buckets.
	1 field companion.
15 Riding animals.	1 farrier's chest.
	1 set branding irons.
212 Draught animals.	1 set scales and weights for rations.
	Shoeing smiths', farriers', saddlers', and
	wheelers' tools.
	Wheel grease and material for three months' repairs.

Divisions of elephants depend upon the number of these animals available for service; divisions of horses, mules, and bullocks for drawing wagons or carts by the staging system of relays depend upon the number of carts available, and can conveniently be formed according to one of the above cadres.

Depôts for the sick animals of the transport require to be formed and placed at convenient distances along the line of communication; the following establishment would be generally sufficient for the efficient working of each dépôt:—

- 1 Officer in charge.
- 1 Staff Sergeant.
- 2 Superintendents.
- 1 Veterinary Surgeon.
- 1 Farrier Major.
- 2 Shoeing Smiths. 50 Men.

As the wear and tear of the transport material will be considerable in the course of a campaign, the formation of parks for the repairs of carriages, harness, saddlery, gear, &c., becomes necessary. These parks have charge of repairing and maintaining the carriages and equipment of the Military Transport in efficient order, by executing all the larger repairs to which the artificers attached to the various divisions of the Transport Corps cannot attend.

Each Army Corps should have its own repairing park, besides which one of larger dimensions should be established in rear of the army, in some suitable place on the principal line of operations. This reserve park, is stationary, and, being in communication with the army and the base, receives and forwards, according as it becomes necessary, the

reserves of all material required for repairs by Army Corps parks and division artificers. It attends to all the repairs which cannot be done by the parks moving with the army, and, in urgent cases, it even undertakes any new constructions which may become necessary.

The following establishment for an Army Corps repairing park would be sufficient for all requirements :—

1 Officer in charge.	
1 Staff Sergeant.	
1 Superintendent of Works.	
1 Clerk.	
30 Artificers.....	{ Blacksmiths. Carpenters. Saddlers. Rope-makers. Wheelers. Painters.
2 Forge carts.	
4 Wagons	{ To convey iron, wood, leather, cloth, rope, and other material for repair.
24 Horses.	
12 Drivers.	

The reserve park demands a large number of artificers, and can draw for these on the resources of the country with advantage.

The strength of the various divisions here proposed is not large, and one officer assisted by his subordinates should be sufficient to exercise such supervision as would ensure the thorough efficiency of his division. Lord Napier, in his correspondence on the transport for the Looshai Expedition, recommends ample superintendence, with a regular gradation of responsibility, their absence having invariably resulted in a certain degree of failure.

A properly organized transport renders the line of march more regular; the drivers or carriers, being well overlooked, readily obey orders and conform to the instructions they receive; the better disciplined the men, the more orderly will the march be. The drivers, regularly paid and fed, serve cheerfully, and the desertions will be few. They will get also confidence in each other, and will conduct themselves well under trying circumstances. The hostility of the inhabitants, often caused by the bad behaviour towards them of camp followers and drivers of baggage animals, will be in great part reduced.

Everything that tends to make order out of chaos must be of advantage in military organization; hence dressing the drivers or carriers all alike (at all events, those belonging to the first line of transport, to show to what branch of the service they belong), must be of undoubted advantage. The extra

expense will amply repay itself by the men being kept in good health and spirits, besides which a man in a known dress is not likely to misconduct himself, for fear of being easily detected.

It is a difficult matter to propose anything regarding the best dress for transport men ; but, whatever dress is adopted, it should always be suitable to the climate and season in which the men have to work. Transport men are constantly obliged to assist personally in loading and unloading wagons, have to alter loads, adjust harness, put on and take off the drag, &c., and their dress should be such as not to hinder them in the performance of these duties. A blue or drab-coloured frock, of some good wearing material, suited to the climate, would undoubtedly answer well in most cases. For men of Eastern climates there is no better head-dress than a turban ; and for the others a broadbrimmed hat, something like that worn by the Italian Bersaglieri, with a double chamber for tropical climates, would be at the same time a most useful and becoming head-dress.

In the Duffla Expedition the carriers were served out with blanket coats and trowsers, and nothing better could have been issued for the country they were called to work in. For carriers in India, sandals, or *chupplies*, with cloth bandages to wind round the leg, are very useful.

The drivers should be furnished with good boots or shoes ; this point demands attention, and it will be found that boots from home will be the best and the most economical to issue. Long boots are difficult to put on when wet, and uncomfortable to walk in ; ankle boots and gaiters (with hooks and laces, not with buttons) are preferable for men who have to ride.

Each man should be in possession of a good clasp knife, to be worn with a lanyard round the neck, sailor-fashion. The long cavalry sabre issued to the drivers of the Army Service Corps always gets in men's way, and the same objection to it has been raised by officers of Continental armies ; where the men are to be armed, a good revolver will be found the best weapon to issue for all purposes. If a sword is thought indispensable, it should be a short one in a wooden scabbard.

The transport men, if dressed at all, should be dressed neatly and serviceably, but they are engaged for work, and for work in all weathers, and anything about their dress which will demand a deal of cleaning and furnishing should be avoided.

If the service is to be in cold and wet countries, a great-coat of some description must be issued. A good Scotch plaid of rough material would perhaps answer better than a great-coat. It can be worn in a variety of ways, and if wound round the chest and back it will be a good protection against both cold and rain, whilst the driver's arms are left free for use. It is easily spread out to dry, it rolls up in a small compass, and can be used in place of a second blanket.

In cases in which clothing the Transport Corps men, is considered inopportune, they should notwithstanding be provided with metal labels, showing the corps or department they are temporarily attached to, and their own number, as well as that of the Transport Division to which they belong. When there is time, it will be found a better plan to stitch cloth numbers to the clothing itself, for metal labels can be torn off or lost.

It will materially help in keeping the accounts if each driver is provided with a small book or card, on which all particulars connected with his engagement, pay, promotion, reduction, issues of clothing, &c., are entered by the officer in charge of the division he belongs to.

Transport men have to endure a good deal of fatigue, and it is only right that they should be regularly and well fed.
Rations. It is impossible to fix a scale of rations, as much depends on the country and the habits of the people employed. Tobacco and opium,* in countries where these luxuries are not to be purchased, should be procured for the men, as those who are accustomed to indulge in them regularly will feel greatly the want of them on service.

Many desertions amongst the carriers in the war on the Gold Coast were caused by the non-issue of rations. Very true that the carriers received a money allowance in lieu thereof, but the country had been devastated by the enemy, and there was no food to be obtained. Amongst the Engineer labourers, to whom rations were regularly issued, there were fewer desertions than amongst the other men. When rice, towards the close of the war, was issued to most of the carriers, the non-issue of salt was the cause of a good many cases of diarrhoea.

The scale of pay should be liberal, to induce a good set of men to engage. The men should be paid regularly (once a week is most convenient), and the payments should be made by the officers. The less subordinates, particularly native, have to do with money the better.
Pay.

Shelter for men in cold, rainy, and unhealthy climates is a necessity. The difference of temperature between the day and the night in most tropical countries is very marked, and is one of the principal sources of disease. Natives of most wild countries are very clever in constructing sheds, or lean-to huts, for shelter, and these answer very well when no tents are issued.
Shelter Huts.

The Ashantee warriors and carriers constructed in their camps small lean-to huts, each capable of sheltering two or three men. These consisted of light frames of sticks inclined at an angle of 45°; over these were

* The privation of the drug, instead of invigorating the men and fitting them for work, would in most cases have the contrary effect: the habitual smokers would have pined away, and eventually died. (Swinhoe's *North China Campaign* of 1860.)

spread leaves of plantains, which in that country grow very plentifully and large. Often in their camps were also found small bedsteads, likewise made of sticks bound together, raised some five or six inches from the ground—a very easy arrangement, and a very desirable one, too, in a swampy and pestilential country like Ashantee, where there was any amount of material at hand.

All cleanliness is conducive to health, particularly where there are large gatherings of men. All conservancy arrangements require to be carefully supervised by the officers, the men being made to parade when opportunities occur, to show they keep themselves clean.

It should be borne in mind that, however it may be intended
 Enlistment. to expand the present home transport in case of war, it has always been found difficult enough for England to obtain recruits for the combatant ranks, so much so that foreigners have been enlisted in large numbers in her army in the last two European wars she has been engaged in. A large portion of our transport will always be manned by foreigners, recruited from the countries in the neighbourhood of the seat of war, and experience goes to show that these men require to be kept under strict discipline. A mixture of our home transport with the foreign element will be found to answer, if the latter are regularly enlisted, and by the terms of their engagement complete control can be obtained over them.

Experience has shown that this foreign element is often a source of weakness ; if we could dispense with it, the efficiency of the transport would be more secure.

The drivers should be engaged to serve for a stated period, according to what the length of the campaign is expected to be with the understanding that should it be protracted longer their engagement must continue until their services can be dispensed with.

At the time of enlistment the men should receive full information regarding their terms of engagement, their pay, rations, clothing, pay remittances to their families, return passage home, rewards, promotion, and punishments. Full information regarding these points and the extent of their duties, once given, will save a deal of trouble for the future.

The military organization of the first line of transport is a necessity, but it should not be carried too far ; the main objects to obtain are to accustom the men to obey readily the orders they receive from their superiors ; to habituate them to move in large masses with order and regularity, and to obtain a cheerful performance of their duties both in camp and on the line of march. To impart military precision to all their movements, and to deprive them of that elasticity which is so necessary to a Transport Corps, would be a fatal error.

A certain amount of drill will be necessary both on foot and mounted, but it should be restricted to the most simple and necessary movements. For the first, such as will be necessary for inspecting the men and marching them regularly to and from the lines, saluting, sentry, and picquet duty ; for the second, mounting and dismounting, taking ground to a flank, forming to the front, flanks and rear, advancing and retiring in line and from a flank, and forming double column on the march. All these movements are easily picked up in a few days by most men ; any further it would be unnecessary to go.

The reports of the unhealthy climate of some countries will have a marked effect on recruiting of drivers, and it might be therefore at times necessary to offer some kind of gratuity to men invalidated from the effects of the climate, which, in case of the man's death, might be passed over to his family.

Every officer acquainted with our military history cannot fail to have remarked the continual recurrence of our small wars and expeditions ; these demand a special education for our officers, and an organization suitable for small armies serving principally in uncivilized countries. In these the transport becomes a point demanding particular attention, for we must bear in mind that in most of these expeditions we move the best fed and cared-for troops in Europe in countries far from home, in trying climates, over bad roads, and across unproductive districts.

It is our duty to prepare all the details for the mobilization of our home army ; it shows a state of readiness which will go far to reassure the country, and will do much to allay those constantly-recurring alarms of invasion which from time to time disturb the minds of our people. It is doubtful, however, if we shall ever be in a position to place a large army in the field in Europe ; for what would be the use of sending abroad Army Corps, when foreign armies have in our days hundreds of thousands of men always ready to commence hostilities with ? In the Napoleonic wars, when our gold kept large armies in the field all through the Continent of Europe, we could not raise enough men in our own country to fight in the Peninsula and in Belgium, and the armies led by the Duke of Wellington were full of foreign mercenaries. With the obligations towards general military service which is the law of all nations on the Continent of Europe, it will be more difficult for England to obtain foreign mercenaries now than it was in her former wars, if not even impossible. Setting aside the unaggressive spirit of our people, and the opposition towards engaging in a war, however righteous the cause may be, we have not enough of troops to engage single-handed in a continental war. Our best authorities have repeatedly expressed their opinion that to raise a numerous army in England some system of conscription is absolutely necessary ; but from the introduction of this we seem to be as far as ever we were.

For the small wars and military expeditions in which we find ourselves continually engaged is required a special organization—a well-prepared system which will admit of our working, in a certain way, independently of assistance from home, making the most of all material we find ready at hand. This part of our organization has not as yet received the attention it deserves; all our efforts have been lately directed towards preparing for any possible contingency that may lead us into war in Europe, but our expeditions in far-away uncivilized countries, which are a reality and of frequent occurrence, have not as yet been taken into consideration.

The Transport Corps at present serving entirely at home loses many opportunities of useful instruction abroad. What, it may be asked, is the advantage of keeping a Transport Corps at home when we see part of it sent out to New Zealand only towards the end of the war; not sent at all to Abyssinia, though the transport there was one of the principal difficulties of the expedition? And was not on the Gold Coast the raising of a Transport Corps entrusted to a Supply, and not to a Transport, Officer of the Control Department?

The subject of Military Transport, particularly for us, is of immense importance, and there is no doubt that it requires to be entrusted to the care of some officer of experience, who should devote his entire attention to it.

This officer should become acquainted with the principal markets where animals can be obtained; with the best contractors for saddlery, harness, &c.; with the time required for various contracts to be fulfilled, and the cost of the various articles. He should study the system of Military Transport of foreign armies, and propose for adoption all the improvements in wagons, ambulances, and equipment that possess particular points of recommendation in their favour. He should prepare schemes for transport arrangements suited to various countries, based on our former experiences; and to him should all reports of future transport operations be sent, so that all that recommends itself as good may be adopted in future cases, and all that is bad be eliminated. He should have lists of officers, good judges of horses and accustomed to the management of animals, to send abroad to make the purchases required on the formation of a corps; and should also have rolls of officers who have served in this branch, and are capable of serving in it again when the necessity arrives.

With an officer entrusted with the study of all that concerns Army Transport in time of peace, it would be a small matter not keeping up a large corps, which would be, no doubt, a great expense to the State. Everything would be fore-thought and prepared, and on the outbreak of a war or expedition this branch of the service would be conducted by an officer of experience, and not, as often occurs now by a totally untried and inexperienced officer.

The officering of the Transport Corps should not present any great difficulty. All regiments, corps, and departments should be complete in officers on service, and it is not advocated to remove any officers from these. In our army it will not be a difficult matter to obtain volunteers from the half-pay list, from regiments and corps not called to take part in the war, and from officers on furlough from the Indian Army. A roll of officers ready to come forward for this service, when called upon, might be prepared beforehand by the officer in charge of the department, who would, after ascertaining the qualifications of each separate officer be able to make a good selection.

With all the requirements of an Army on transport matters carefully studied in time of peace, with everything prepared beforehand, and nothing left to chance, it is naturally presumed that an efficient transport for our army could be set on foot in a very brief space of time, and with a good deal of saving of public money.

It should be the business of every department of the army to study attentively in time of peace all that would have to be attended to on the outbreak of a war, to prepare carefully-detailed plans of the various operations which would have to be carried out, arranging for everything in such a way as to ensure that, at whatever moment the order to place an army on a war footing may arrive, the work will be carried out effectively and in the shortest space of time.

The question has been raised abroad of having one Transport Train to supply horses and drivers for the entire army, embracing the Artillery, Engineers, &c. ; and this system has been adopted in the Italian army, but there are very serious objections against the system, and the advantages advocated are not of sufficient importance. Even in the Italian army the adoption of this system has been strongly opposed and severely criticised.

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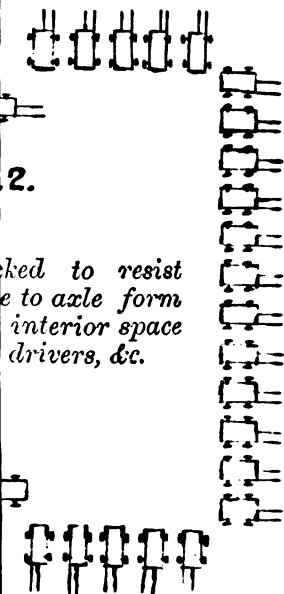
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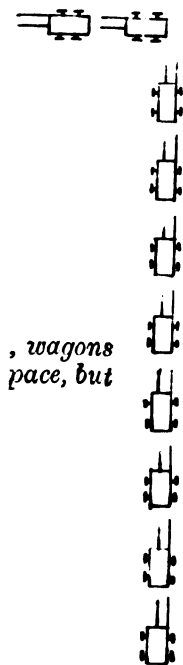
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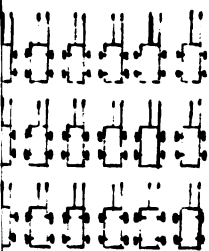
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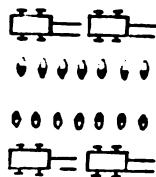
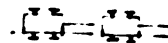


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II.

NOTE ON THE ORGANIZATION OF A LOCAL FORCE FOR
SELF-DEFENCE.

BY MAJOR H. GRAY, BENGAL STAFF CORPS.

1. The prospect of a great European struggle likely to tax the mother country's whole strength has led all her colonies to examine their means of defence. Nowhere is this more urgently necessary than in India, which, though not so vulnerable as is generally supposed in Europe, contains, no doubt, an internal source of danger in an excitable population. It is unlikely that, after the experience of 1857, the British force in this country will be much diminished, save under stringent military necessity. Nevertheless, in an European War, success in the western theatre is the first consideration, and every thing must be risked to ensure it.

2. The Indian Government cannot therefore be behindhand in taking every possible measure, not only for the defence of the sea-board but, for supplementing the internal garrison, and thus enabling the British force in India to detach to Europe without incurring too great a risk to our power in this country.

REGULAR LOCAL CORPS.

3. There is a considerable population of European descent in this country which has not education sufficient to earn its livelihood with the pen, which has no opening for the practice of handicrafts, which is not admitted into the ranks of European regiments, which cannot dig, but which, as demonstrated in 1857, is perfectly capable of military service. From this material might be enlisted local battalions of Infantry and garrison companies of Artillery

at the Presidency towns and other great centres, such as Allahabad, Lucknow &c. This unworked field would supply, probably, several such battalions and companies, which, if not so efficient as the regular European troops, would also cost much less. Being strictly local and not leaving their fixed Head-quarters, except to take the field, the men could live with their families on less pay and advantages than are requisite for the English soldier in India; they would not be imported and exported at the great cost of that soldier; and they would be ready seasoned to the climate and would not require nearly so much outlay in housing and other measures to keep them in health.

4. The objection to a local army can apply only to Local British Regiments; that is, to a force recruited from the same field as the general army, but denied the same opportunities of attaining efficiency. The force now proposed will not compete in any recruiting field with the regular army, but will utilise a material existing on the spot, and will furnish troops supplying, to a certain extent, the place of an equal number of English troops, at much less expense.

5. If the lower class of Eurasians were utilised in this manner, and the Volunteer movement, taken up as yet in India more for amusement than in earnest, were so developed as to embrace, with the Militia provided as explained further on, the whole remaining fighting strength of Europeans Indo-Britons and Eurasians, official and non-official, in this country,* then there would be a local force so formidable in numbers equipment and morale that a

* In 1872 there were 80,000 males (Non-Military) of Europeans, Indo-Britons and Eurasians.
(Prog's U. S. 1. January 1875).

garrison of British troops as small, almost, as that of 1856, would suffice to secure the Indian Empire—at any rate for a certain period. In other words there would be always 20,000 British troops available to reinforce our armies in Europe at any crisis of a war. Moreover a portion of this reduction of strength of the British regular troops might be permanent. Some thousand British soldiers might be spared altogether, thus permitting of a saving greatly in excess of the cost of the measure proposed.

VOLUNTEERS.

* E. G. (a) the free grant of 100 or 200 rounds of ammunition annually in addition to the present allowance for the annual course. (b) free uniforms (c) A half—holiday weekly during winter to Government servants (d) an increase in the capitation grant to 40/. per efficient member.—(e.) a bonus of Rs. 100/ on passing in drill and musketry.

6. To attain these objects it is first desirable to encourage the Volunteer movement in every possible way.* It is well known that there are many persons who are willing, and indeed anxious, to learn musketry and a certain amount of drill, and to become efficient members of a great local reserve for purposes of defence, but who are deterred by various causes from joining Volunteer Corps on the present terms of existence of those bodies. Many of those objections might be easily removed.

In the second place it is necessary to render service of another description obligatory by law upon all who will not or cannot enter the ranks of the regular local troops or of the Volunteers.

7. The first is a matter with which I do not propose to deal at length here; generally it appears to me desirable to relieve the Volunteer Corps of some of the expenses at present met by their subscriptions, while defining more stringently their obligations to the State and removing some of the limitations on their usefulness.

8. The provisions which appear desirable in the second view are detailed below. The success of such a measure as proposed would appear in its minimising the number of persons liable to the more onerous of these provisions; that is to say in leaving but a small active force outside of the ranks of the Regular Local Corps and of the Volunteer Corps :—

Sections I and II. The object sought is to include under the Act every European Indo-Briton and Eurasian in India. The definition of European British Subject in Act X of 1872 is too limited for the purpose. Eurasians to be European British subjects, under that definition, must be legitimate. A bastard of pure English blood born in India, under that definition, is not an European British subject. But for the purposes of this Act every individual should be included whose interests are bound up by tie of blood and tongue with those of the European community. Therefore the term progenitor or male ancestor is used, and legitimacy is disregarded. The son of a native of India by an English woman would, almost certainly, be in sympathy with his father's community; but the great grandson of a native of Europe by an Indian woman would probably claim with pride community of interest with his progenitor's stock.

It is evident that if any measure for the establishment of an organization for self-defence is to succeed, no exceptions to the general liability for service can be permitted, save those specified in Section XIII, unless by special order of the Government,

MILITIA.

I. A British Militia force should be created by act, service in which should be compulsory.—

This act should extend to the whole of British India, and apply to all persons descended from European progenitors.

II. All persons of European descent, between the ages of eighteen and forty eight years, should be liable, during residence in India, to serve in the British Milita Force.

Between the ages of eighteen and thirty six years, this service should be in the Active Force; and, between the ages of thirty six and forty eight years, in the Reserve.

and for reasons of State, as provided in Section XVI. The subject is one which comes home to the entire Anglo-Indian community. All must feel that it is, at any rate, *possible* that a convulsion such as took place in 1857 may, in some form or another, again occur. Of course the risk of its ever again taking that particular form has been greatly obviated, as the magazines and artillery are not now available to a mutinous army, the army itself is no longer homogeneous, and the eventual completion of the Martini-Henry armament will place in the hands of that army a weapon useless against the State. Nevertheless the materials for a general conflagration always must exist in India, and every reasoning person must understand the desirability of possessing facilities for self protection. Thus no one can urge a rational objection to an organization in that view; and, admitting its advisability, all must see that such an organization, to be useful, must be general. The Volunteer Corps furnish a way for individuals, objecting to militia service, to associate themselves in this organization in a manner more pleasant to themselves; and the requirements of service in the reserve are so light as entirely to meet the convenience of those members of the Indian Community whose years give them a valid ground for objecting to undertake onerous military obligations. The first great object is that every able bodied member of the Community should possess and be able to use the regulation rifle. In addition to this, in the case of the younger men, it is desirable that a knowledge of the manner of using the rifle in combined bodies should be acquired. Eventually, as these pass into the reserve, the entire

Anglo-Indian Community will possess this knowledge, and will be able on occasion to combine for self defence.

Section III. Fifteen Annual drills was the number fixed by the French Government in the case of the Mobile force. This instruction was considered adequate to impart a certain tincture of military knowledge, sufficient to enable that force to undertake garrison duties. The efficient volunteer and militia man will begin with, what the mobile had not, a competent knowledge of drill and musketry, and the 10 days annual exercise of the militia-man or the 9 annual drills of the efficient Volunteer will be ample to keep this up to the standard required, which is by no means that of an efficient soldier of the regular army though superior to that achieved in the case of the Garde mobile. Those who cannot afford to give 10 consecutive days of their time to militia exercise have their remedy in joining the Volunteers. But that the tax on the time of the general community is not too great is shewn by the 15 annual drills required from the mobiles. In fact by arranging the dates of embodiment so that the various units of a corps or battery may be embodied at different times, inconvenience to the Public Service may be in a great measure avoided; while the total number of working hours in the year may be easily made up by overtime, and by foregoing certain existing general holidays.

Section IV. The duties required of a force such as proposed, and which should equally apply in the case of the Volunteers, are, to hold the garrisons in the absence of the regular army and to maintain law

III. The Active Force should be embodied for exercise for 10 days in every year, on various dates to be fixed by the Commander-in-Chief for each unit of embodiment. And it might be embodied for garrison service, within British India, on or after the outbreak of war, for a period not exceeding the duration of such war.

The members of the Reserve should attend muster for one day in each year, during the annual embodiment of the Active Force; and they might be embodied with the Active Force, for garrison service within British India, on occasions of imminent danger to the State, and during the continuance of such danger.

IV. By garrison service is meant any duty pertaining to the protection of the Empire, and to the maintenance of Law and Order.

* The limit, if there must be a limit, might be that of the administrative command.

V. The British Militia Force should comprise Infantry and Garrison artillery only. The Infantry of the Active Force should be organized in corps of various strength, not exceeding 300 bayonets; and the Artillery of the Active Force in batteries of various strength not exceeding 75 Non-Commissioned Officers and men.

The reserves of each corps and battery should be in excess of the above strength up to a limit of 50 per cent. on the strength of the active body. Reserves in excess of this limit should be affiliated to Volunteer corps, or otherwise assigned modes of embodiment as the Commander-in-Chief might direct.

These corps and companies should have fixed Head-quarters in suitable Military Cantonments under the orders of the Officer

and order in the same way as such garrisons do, or may be called on to do. The 4 mile limit of a Volunteer Corps' service is entirely unsuitable and should be abolished.* An emeute might require the presence of a detachment 50 miles from a garrison, and, as the entire community is equally concerned in the maintenance of order, which is a phase of self protection, there should be no limitation on the availability of bodies assembled for that purpose. The members of the Reserve, however, should not ordinarily be required to fulfil this duty, but only under those desperate circumstances when every rifle of the community must be assembled for the maintenance of a dominion on which every life in the community depends.

Section V. Cavalry and Mounted rifles are arms which an organization such as is proposed cannot pretend to furnish. Volunteers of a certain position have formed such corps, and their utility was demonstrated in 1857. Such are, however, exceptional, and are, together with batteries of Field artillery and companies of Engineers, quite beyond the scope of the present scheme. The mass of a local force for self-defence furnished by the Indian Community must of necessity be foot rifle men; though here and there, in large cantonments, it is possible to form efficient Volunteer or militia garrison batteries competent to aid in manning the guns of the great forts, or those of entrenchments that may be thrown up for the defence of a garrison. The strength of corps and batteries should be such as not to embrace too large an area inhabited by its members; in the latter case these, if possible, should all belong to the

Head-quarter station. The strength taken for each is the maximum contemplated by the Volunteer Regulations. The limits fixed, however, will not preclude the incorporation of militia corps with other militia corps, or with Volunteer Corps, in administration battalions—or of militia batteries together in brigades. The incorporation of reserves is limited to such a number as will not swamp the ranks of the Active bodies with less efficient men. Surplus reserve men should be incorporated with Volunteer or Local Corps. Should the act so work as to create but few active corps, there will result a considerable reserve composed of persons passing out of the Volunteer and local corps, and these will be affiliated thereto.

Section VI. The many general duty officers now wasting their time in different stations in India will, under the arrangement proposed, now find useful employment. There are, besides, not a few retired officers who can be thus utilized to better advantage than in the Reserve, and many officers in civil employ who can afford the time requisite for the light duties of the militia, and who would be competent and willing to undertake such, instead of being relegated to the reserve. These three classes would probably, at first at any rate, suffice for all the higher ranks in the militia and Volunteers; and, as the first and third classes diminish,* the 4th class will become competent to undertake the duties. But the commandant of each battery must always be a regular artillery

Commanding the station,—to whose command all Militia should belong whose Head-quarters are in his garrison.

To each such Head-quarters should be attached an officer of the Regular Army. In the case of Artillery this officer should be the commandant and paymaster of the battery, and in that of Infantry, this officer should be adjutant quarter-master and paymaster of the corps. It should be the duty of this officer to make all arrangements relating to the interior economy of the corps or battery, subordinate, in the case of Infantry, to the Commandant if present. He should also instruct in drill and musketry, and should be assisted by sergeant instructors and drill instructors supplied from the Regular army on the same scale as laid down in the case of Volunteer corps.

VI. The Militia Force should be officered in the following manner:—

A. Commissioned ranks.

1. By Military Officers doing general duty or unattached.

2. By Military Officers on the Pension or Invalid establishments.

3. By selection from such members of the Reserve, described in para. 3 section XIII, as may be willing to serve in the Active Force in this rank, and whose services, if in Government or Guaranteed Railway employ, can be spared for such service.

* Fewer Infantry Officers being appointed yearly to Department Public Works or Civil Administration, and General duty Officers retiring and dying out.

4. By selection from the Civil members of the Active Force.

In the first three cases commissions should be given for the Militia Force irrespective of the military rank of the officers. In the fourth case the commissions should be provisional, and their confirmation subject to the officers passing the examination prescribed in the case of officers of their rank in Volunteer corps, within two years from date of appointment.

As far as possible the Commandant of each Infantry corps should be a Military Officer of the Infantry, and in that case such officer should be posted to the garrison in which the Headquarters of his corps are fixed.

B. Non-commissioned ranks.

1. By selection from such members of the Reserve, described in para. 3 section XIII. as may be willing to serve in the Active Force in this rank, and whose services, if in Government or Guaranteed Railway employ, can be spared for this purpose.

2. By selection from the Civil members of the force.

C. The establishment of officers and Non-Commissioned Officers for each corps or battery should be that laid down for Volunteer corps of the same strength in the Indian Volunteer Regulations.

VII. It should not be necessary to embody entire corps and batteries at their respective Headquarters, save when the

officer, and each Infantry corps must also have one thoroughly competent Staff Officer from the Active Army.

Similarly among the Warrant and Non-Commissioned Officers of the army in Public Works and other Civil employ, and among the retired soldiers on the Railways and in other employments, it is probable that many would be found willing and available to be utilized to better purpose than in the Reserve, and who, with the regular Instructors supplied from the active army, would adequately leaven the less competent mass of civilian Non-Commissioned Officers.

Section VII. It is absolutely necessary that, on service, local bodies of troops like Militia and Volunteers should be incorporated

force is called out for garrison service. When so embodied the corps or battery should be in every respect on the footing of regular troops, and should form a component part of the force under the Officer Commanding the garrison in which the Head-quarters of the force is situated. In this case the Militia Officers should not, by virtue of their Military commissions or of their Militia rank, take command of any officer of the Regular army above the rank of subaltern, unless by special order of the Commander-in-Chief.

VIII. For the annual exercise, the half company of not less than 15 files, under a commissioned officer, should be the unit of embodiment. Each such half company should have its point of assembly fixed in a convenient Military Cantonment, where it should be attached for instruction to a regiment or battery European or Native. When more than one half company of the same corps or battery are embodied in a cantonment they might be embodied together; and if one half or more of the total strength of a corps or battery is thus combined at its permanent Head-quarters, such body might be instructed by its own officers without being attached to a regular regiment or battery. Until such times as a corps or battery had its complement of qualified Commissioned and Non-Commissioned Officers, such should be lent thereto from an European regiment or battery during embodiment.

The Place of Muster for any member of the Reserve should

in the Military command within the limits of which they are formed. At the same time it would be to the prejudice of the service that the officers of those corps, who are not trained up to the standard of those of the regular army, should have the power of taking command of the latter.

Section VIII & IX. The object sought is to render the obligation of service in the active force as little onerous as possible. Those of service in the reserve are simply nominal, save in the case of such danger as renders self preservation imperative. To embody whole corps and batteries yearly would entail upon some members long journeys, and this is obviated by fixing small units of embodiment placed as conveniently as possible for the persons concerned. To fix one date of embodiment for exercise for the whole force would cause unnecessary inconvenience to the community; these dates can therefore be so arranged consecutively as to interfere the least possible with the Public service and with commercial interests. To prevent fractions of corps and batteries, thus embodied at different times, from losing the advantages of instruction in large bodies, it is provided that they should exercise with regular troops; but, to prevent inconvenience or annoyance to individuals, they will be combined with such for instruction only, and will be quartered

be the point of embodiment of the nearest unit of the active body to which he is attached.

IX. When embodied for exercise, whether attached to a regiment or battery, or independently, the Militia Force should be under Military Law, but should not be subject to Military duty on the footing of regular troops, as provided by section VII. in the case of embodiment for service. The bodies of Militia attached to the regular troops should be camped or quartered separately from them, and should be combined with them only for purposes of instruction.

X. The instruction of the Militia should be as simple as possible. It should be directed mainly, in the case of Infantry, to the attainment of efficiency in skirmishing, entrenching and outpost duties; in that of Artillery, to the handling of heavy guns.

XI. Members of the Active Force, who have not done 3 years Active Military service, should not attend the annual exercise until they have passed in drill and musketry. But all members of the Reserve should attend the annual musters.

Although the Reserve would not be liable to yearly embodiment for exercise, nevertheless any member thereof might attend the exercise of any unit of the active body, or might join the drills of any Volunteer Corps. In the first case he should enjoy the advantages allowed to members of the active body by paras 2 and 3 of section VII.

apart. Whether embodied for exercise or for service it is necessary to apply to such bodies of men the provisions of the articles of war. These however may in their case be subject to limitations as laid down in section 8 of the Indian Volunteers Act.

Sections X & XI. The standard of acquirements described in section XV of the Indian Volunteer regulations is adequate in the case of the Militia, and the facilities and penalties provided are those which appear necessary to ensure the attainment of this standard. To obtain the full advantages of the very short period of annual embodiment it is necessary that each member should render himself efficient before attending the annual exercise. This is by no means difficult. The greater portion of the community reside in stations where military instruction is available; when such is not the case, nor any such station easily attainable, a musketry course can be gone through alone by an intelligent person after receiving the first instructions, and a fair knowledge of simple movements can be obtained at the nearest Head-quarters of Police.

For the purpose of passing in drill and musketry any member might apply for instruction to the Officer Commanding any regiment or battery in Her Majesty's service, who should be bound to afford such instruction in the manner most convenient to the applicant, in so far as his convenience may not conflict with the public service. It should be however at the option of all members to obtain instruction in any other way.

But every member of the active force who has not done three year's active Military service should pass in both the above subjects, by a standard to be fixed by the Commander-in-Chief in the general sense of para. 221 of the Indian Volunteer Regulations, within two years from date of entering the force. Failing this he should be liable to be attached till he has so passed, on the footing of a regular recruit, to such regiment or battery of Her Majesty's army as may be directed by the Officer Commanding the station in which the Head-quarters of his corps or battery are fixed.

Section XII. Victoria is paying her Volunteers 5 shillings a week. Efficient Indian Volunteers receive an equal amount per month. These allowances go, no doubt, to meet expenses which, in the case of the Militia, will be borne by Government; but it is the uncompensated expenses incurred which deter many persons in India from joining Volunteer Corps,* and the present scheme is proposed to embrace a large section of the community who cannot afford to give their time quite gratis. It

XII. Any person enrolled under the Act, not being a servant of Government, or of any guaranteed Railway Company, receiving above 50 Rupees per mensem, should be entitled, on making affidavit that his yearly income does not exceed Rupees 600 per annum, to claim pay, if a private, at the rate of Rs. 5 per

* The present Government Capitation grant of 20 per annum to those who have not passed out of the 3rd class of musketry and 30 per annum to those who have, is totally inadequate to meet

all expense. The result is that the men and officers have to pay for many things out of their own pockets ; so long as this is so the Volunteer movement will never be so popular as it is at home.—

ensem, and, if a Non-Commissioned Officer, at the rate of Rs. 10 per mensem, while in the Active Force.

All corps or batteries enrolled under the Act should receive arms, ammunition and uniform from Government, and other necessary expenses should be defrayed by Government on a fixed scale according to the strength of the corps or battery. When embodied for exercise they should be accommodated in tents or barracks and receive free rations. When embodied for service they should be placed in every respect upon the footing of regular troops.

* This provision should be made applicable to Volunteer corps.—

When the Militia Force is embodied for exercise or service, or when members of the Force proceed to Military Cantonments for instruction in drill and musketry, their expenses by rail at intermediate class rates, and by road at 2 annas a mile should be paid by Government.

On passing in drill and musketry, within two years of entering the force, any member of the force below the rank of Commissioned Officer should be entitled to claim a sum of Rupees 100 to cover his expenses while receiving instruction.

XIII. 1. Persons in Active Military employment, persons above the age of 42 years in the

is not much to afford such persons 2s. 6d. a week and their uniforms, besides travelling expenses and free rations when embodied for exercise ; and it is very expedient to double the amount of monthly pay to encourage such to qualify themselves as Non-Commissioned Officers. When embodied for service, to take the place of regular troops, officers and men should of course be paid and treated on the same footing as regulars, provided that servants of Government should not receive more pay than that pertaining to their substantive appointments.

To learn drill and musketry will entail a certain expense, besides that met by the travelling allowance, on members who have to leave their homes for that purpose. To meet this, and to encourage the poorer members of the community to make themselves speedily efficient, a *bonus is proposed for members on passing in drill and musketry.

Section XIII. Persons above 42 years who have no tincture of military knowledge are not likely

to be useful members of a reserve force, and it is expedient at the outset to exercise indulgence towards such.

German experience shews that myopy is no real disability, and, in fact, there are many forms of disability recognized in the army which should not interfere with the operation of the proposed Act. Nothing should be so regarded, in the case of the reserve, which would not prevent a man from using a rifle efficiently for a few hours at a time.

Service in the Volunteers is identical as concerns the objects of the Act with service in the Militia, so long as efficiency is maintained.

A person who has done 3 years active service in the army is presumably as efficient as any militia man or Volunteer, and, as the only object of service in the Active Force is the attainment of efficiency, such persons may be passed at once into the Reserve.

Some indulgence is expedient at the outset, and such may be extended to persons above 30 years of age, who, under the provisions of the Act, would have only 6 years to pass in the Active Force, of which two years would elapse before they were efficient. Though it is, of course, desirable that the Reserve should comprise efficient members, such efficiency cannot at once be arrived at, and it will be much if every man in it is thoroughly competent to handle a rifle. Eventually, of course, all members of the Reserve will have passed through the Active Force of Volunteers or regular troops, and then that force will be thoroughly efficient.

year of passing of the Act, and persons pronounced physically unfit by a medical board, should be exempted from the operation of the Act:—

Provided that; myopy should not be considered as physical unfitness.

2. Any person borne on the strength of a Volunteer Corps should be exempt from the operation of the Act:—

Provided that;—

1. He furnish within two years of the date of passing of the Act, a certificate of having passed in drill and musketry and,

2. He continue to furnish yearly thereafter, up to the age of 36 years, certificate of efficiency as a Volunteer.

Failing the above such person should be liable to all the provisions of the Act.

3. Persons who have done 3 year's active Military service should be exempt from enrolment in the Active Force and should be enrolled directly in the Infantry or Artillery Reserve according as their Military service may have been in the Cavalry and Infantry or in the Artillery and Engineers.

4. Persons not coming under exemption (1) (2) and (3), and who attain the age of 30 years in the year in which the Act is passed should be exempt from enrolment in the Active Force, and should be enrolled directly in the Infantry reserve:—

Provided that; they pass in

musketry within one year from the date of passing of the Act.

Failing in this such persons should be liable to all the provisions of the Act.

5. Persons not coming under exemptions (1) (2) and (3), and who are above the age of 36 years and below that of 42 years in the year in which the Act is passed, should be enrolled directly in the Infantry Reserve, and should be allowed one year wherein to pass in musketry. Failing this such persons should be attached to such regiment as the Officer Commanding the Head-quarter station of their corps or company may direct, until they have so passed.

Proviso.—A person coming under the provisions of the last two paras: should not be required to pass in musketry if holding certificate of having been at any time an Efficient Volunteer.

XIV. An Inspector General of Militia and Volunteers for each Presidency should supervise the carrying out of the Act, in consultation with the Officers Commanding stations in which the Head-quarters of Militia corps are fixed, and under the orders of the Commander-in-Chief.

The Commander-in-Chief should frame such Regulations as might be necessary for the guidance of the Officers concerned in carrying out the provisions of the Act.

XV. All persons, not in the employment of Government or of the Guaranteed Railway, liable

Section XIV. The Inspector General's duties should be generally the same as those of the similar officer in England. When the organization and distribution of the Force is once effected, and the points and dates of embodiment of the various units fixed, and the Regulations for the Force framed, this force, and the Volunteer Force (which should be equally subjected to the Command of the Officers Commanding their Head-quarters Stations), will require little but annual inspection on the part of the Inspector Generals.

Section XV. The machinery requisite in India for finding out persons liable to service does not

need to be elaborate, evasion being by no means easy. At the same time it is expedient to provide a penalty calculated to be felt by persons likely to wish to evade the Act.

for service under paras. I. and II of the Act should within 6 months of the date of passing of the Act, or of their becoming so liable, report themselves by letter to the Staff Officer of the nearest Military Cantonment, who shall forward the reports to the Inspector General of Militia and Volunteers.

The letter should give the person's name, age, parentage, and employment, and should state the facts and proofs in support of any claim to exemption under the Act, or in support of a claim to monthly pay.

Nominal rolls giving similar details should be furnished yearly to the Inspector General by Heads of Departments under Government or on the Guaranteed Railways, for all such persons under their authority.

Failure to report as above, should render the person liable to be attached to a regiment or battery of the regular army on the footing of a recruit for such period as the Commander-in-Chief may direct.

Section XVI. Although, generally, the convenanted and unconvenanted Officers of the Government, and the Railway Staff, can undertake the light obligations imposed by this Act without too great inconvenience either to their employers or themselves, still there are certain offices the incumbents of which it might be very inconvenient to draw away from their duties even for a period of ten days. These would be very few in number. The heaviest burden of work and responsibility of all officials in India is borne by

XVI. It should be at the discretion of the Supreme Government to remit all or any of the provisions of the Act in the case of the incumbents of any offices under Government, or on the Guaranteed Railways, regarding which the Local Government, or the Department under which that officer may be, may represent that the Public Service will suffer from the application of the provisions of the Act, or of any of them, to the incumbent of such office.

District Officers ; but even a District Officer could be replaced by his Assistant while he attended his 10 days exercise, (supposing the district Head-quarters not to be at a point of embodiment) and the Assistant in his turn could attend exercise at another point of embodiment, elsewhere, on a subsequent date.

Though few, however, such offices doubtless exist, and it is necessary to provide exemption being afforded to the incumbents of such by order of the Supreme Government.

9. Without better data regarding the numbers and ages of Europeans and East Indians in this country no accurate estimate can be made of the armed strength obtainable under the proposed measure, nor of the cost. I should, however, imagine that five local regiments of Eurasian Infantry of 1000 bayonets each, and six or eight garrison companies of artillery (physique would be a difficulty here) could be raised and maintained in the three Presidency towns and Allahabad and Agra. These would take the place of as many British troops, and, though costing the same in actual monthly pay, they would save Government the cost of the transport, depôts, Home remittances, palatial barracks, etc. etc., which render the British soldier so costly an article. I cannot estimate the amount of this saving.

I should further suppose that the existing strength of 4000 Volunteers in this country would be nearly trebled by the concessions detailed in the note to para 6, and by the pressure of the Act proposed ; and that the Volunteer force would thus cost about eight lakhs per annum.

Finally the proposed Act should include about 20,000 persons in the Active Force and Reserve of the Militia, at a cost of about eighteen lakhs per annum.

If the total cost of 30,000 Volunteers and Militia reached thirty lakhs, all miscellaneous expenses included, it would be little to pay for so strengthening the garrison of India as to set free almost the entire body of British Regular troops for service in the field on the frontier of Hindostan—or a considerable proportion of them for a war in Europe.

III.

NOTES ON MILITARY MEDICAL ORGANIZATION IN INDIA

BY SURGEON MAJOR G. J. H. EVATT, M. D., A. M. D.

SECTION I.

Introductory.

1. I propose in the following paragraphs to examine into the system of Military Medical Organization in India, both in quarters, and in the field, to point out what appears to be some of its weak points as compared with the system of our Home and other European armies, and to offer some suggestions tending to assimilate as far as may be possible the Indian system with modern European ideas.

For my own part I have little doubt that there is a work to be done in India both in developing the efficiency of our Military Hospitals, as well as in laying down certain rules for the working of the Medical service in the field.

2. It is quite certain that any critic who enquires into the existing attempts at a system, will find many defects in it, and however true it may be that in olden times the Medical Organization of the Indian Army, European and Native was good in its rough way, to day it is far behind our English, or other European arrangements. The truth seems to be that England which was for so many years behind the age in the Medical as in other branches of the army, is now well to the front, while India still keeps "marking time" on the rough old tracks of the happy go lucky campaigns of the pre-scientific Military period.

This is a pity. India should be to all of us the nursery and training ground for good military organizations. It should not be possible for us to be able as we now are to accuse Indian service as being actually injurious to our efficiency, and to our development into good Medical Officers. Yet this can be done on fair grounds, and one can appeal with confidence to the judgment of unprejudiced men.

3. When we compare English Military Organization to day with what it was at the period of the Second Punjaub War in 1849, we are simply astounded at the enormous development and progress that has taken place since then, but if we ask what India has done in the meantime what answer can be given save the word "nothing."? India that once led the van now halts in the rear, and England once held fast by ultra conservative military theories, is now awake and rapidly coming to

the front of the nations. We cannot allow India to be accused as it is so often, of being to us what Algiers was to France under the Empire, a school where accurate organization, and correct military ideas, held little sway, and where the efficiency of the army was sapped and undermined instead of being strengthened and developed.

Yet it can easily be shewn that if in Medical Organization India does not make considerable improvements on her existing condition, we can well accuse her of being to us an injurious station. I maintain that weighed by the standard of Modern Military Medical requirements, India does thus injure and sap the efficiency of every Medical Officer, while the present arrangements exist in India.

The simplest way to set to work on this subject is briefly to sketch out the modern European system of Medical Administration in garrison and in the field and then to point out the short comings of India by comparison.

SECTION II.

Modern European system of working the Medical Corps of an Army.

4. Until the period of the War of the Great Rebellion in America in 1860—1865 the system of working the medical aid of an army was everywhere, in the old or the new world, by a system identical in principal with what is called the Regimental Hospital system, that is to say the Medical officers had no real control over the hospitals. The Medical Corps of an Army was quite powerless and was subdivided into a crowd of regimental hospitals as much a part and parcel of the Regiments they belonged to as was the Regimental Band. The Regimental Commanding Officer alone controlled them. The responsibility of working the hospital rested wholly on his shoulders, and the duties of the Inspecting Medical Officers were of the most trifling nature, in fact limited for years to totalling up the amount of extras issued in dieting the patients. The medical service had no autonomy. No medical official however senior had any disciplinary control or power to move or distribute the medical officers, they remained practically chained to the battalions however matters turned. Whether in the field or in quarters the hospitals of the army were wholly separate from each other, and the medical officers carried away by a false *esprit de corps* forgot to aim at medical efficiency as a Department whether in peace or war, and dwelt more upon their Regimental attachments than their Departmental efficiency; owing to this subdivision by Regiments in peace and war great injury was done to the army. In peace the Doctors separated from one another by petty regimental barriers failed to develop a high professional and departmental *esprit de corps*; and the soldier in consequence was deprived of the aids that high medical efficiency can give him in sickness, while in the field owing to the way the medical service was tied hand and foot to the battalions it was impossible to move the Medical aid of the army in any direction it was needed, and the Directing Medical officers being deprived of all administrative power in its fulness in peace, were quite unable for the strain that a campaign always entails upon them.

5. The medical officers instead of being accustomed in peace to do everything needed for war, and to have the fullest control over their hospitals and disposal of the Medical Staff, were kept fast bound in regimental swathing bands until their limbs from sheer disuse grew crippled and powerless.

We went in this way to the Crimea. We had no Army Hospital Corps, no ambulances, no bearer company, no detailed plan for removing the wounded to the field hospitals, nor for evacuating these hospitals when full. No hospital ships. No system of working general hospitals.

The P. M. Os. of Divisions were mere shams, devoid of any control over their officers, and the whole result was worthy of such a system. Twenty thousand dead men slain not by bullets or bayonets but by

disease shocked England to the core. Yet such is the Conservative nature of the English character that until March 1873, no really useful change was made by us.

6. America in 1861 untrammelled by tradition and free to develop her services to suit her wants first freed the Medical corps. She gave to her Medical officers, decentralized and full control in the distribution of the Staff, discipline of the subordinates and thorough freedom in the interior working of her hospitals

The Medical Officers responded freely to the trust and we saw for the first time in history a great Campaign well managed medically. Her hospitals are still quoted as our best models. Her medical officers are men, not children. Men trusted to do their duty and to impress their authority on the subordinates of the hospitals.

Prussia arming for the strife for German Unity next took the field.

The Prussians had for years seized all the intellect of their country and turned it to account in the army. By decentralization and due localization of authority they had developed a splendid military system well up to the age. In the Campaign of Sadowa they proved the efficiency of their organization as soldiers, and their medical service which even then was wondrously free by comparison with ours did well also. But after that Campaign a still further freeing took place. The experiences of 1866 were not lost and by the time the Campaign against France came round in 1870, the German Medical service had attained a high pitch of decentralized perfection, and well sustained its reputation.

7. France on whom the Medical disasters of the Italian war of 1859, had produced little effect was quite unable to compare in point of Medical efficiency with Germany. The Intendance paralysed everything in the Medical service, and it is only since 1871 that the French Medical Department has been freed as it now thoroughly is from Regimental on Intendance Control. The arguments dealing with every side of army medical organization laid before the French House of Assembly are well worth reading by all soldiers, and are models of logical clearness. In England a great movement towards Army reform commenced after the Franco-German war. It came to a head in 1873 by the abolition of the Regimental Hospital system. Between 1873 and 1877 very complete reforms have been carried out in freeing the Medical service, developing the Army Hospital Corps, the Ambulance trains, the Bearer companies, the field Hospitals, and the Etappen and Base hospitals; and finally in 1877, the Command warrant was granted establishing the full disciplinary control of the Medical service over all its officers, non-commissioned Officers and men, in fact making it autonomous.

Thus gradually the English Medical service has been freed from the withering restraints entailed by its old regimental organization and a new organization indetical with the German and American system has been laid down. In one word it has been decentralized from the Regiments. By it the medical system will be the same in peace and in war. In peace the Medical service of each garrison is controlled locally by the senior Medical Officer present. The Hospitals, no longer regimental but Army institutions, are wholly under his surveillance no matter how occupied. The duties in the garrison are allotted as best suits the requirements of the garrison; and the Officer Commanding the garrison holds *one man* responsible for all the Medical arrangements. The Officers, N. C. Os. and men of the Medical Corps, no longer tied to battalions or batteries are available for allotment as needed. The sick no longer scattered in detached and petty hospitals are more concentrated, to their great benefit. The Doctors are brought into closer professional contact, and more esprit de corps, is developed.

A Hospital Corps has been developed wholly our own, and able to assist us in our labours and to carry out all the minor details of the hospitals. A crowd of Senior Medical officers are being trained in the garrisons, who will one day succeed to the post of the Deputy Surgeons General and will be well qualified for the berth. The Department has been unified and has now a chance of being ready for war. In war time the same system will exist. A series of twenty five detached field hospitals will be organized and attached to each Army Corps. These organizations, perfectly complete in every way, can go anywhere and do any medical work. They are as moveable and as independent as a battery of artillery. They can halt or march independently of all troops or can be concentrated or segregated as may be necessary. Each division will have two such hospitals always ready to march. These hospitals can again subdivide into halves, still complete units.

9. The Army Hospital Corps is also trained to form bearer companies of which four will be attached to each Army Corps being one to each division and one to the corps troops and cavalry. These perfect organizations take the wounded from the field and hand them over to the field hospitals after being dressed.

Complete regulations are drawn up for the field Hospitals, Etappen and Base Hospitals, Bearer Companies, and Floating Hospitals; and the career of a man from the time he falls struck with a bullet until he arrives at Netley is as clear as noonday. We now have a system, worthy of the army and the nation and it is well worth studying. It is in unison with the systems of Germany, and America, and, is quite up to the age.

The introduction has been slow and a work of intense labour and difficulty, but it is now accomplished, and no soldier should be ignorant of its working. It is a model of clear military organization.

In India we are still without a system. No one knows how the next campaign will be worked medically, and it is to assist in developing a system suitable to India and the army that is aimed at in this paper.

The subject is of immense interest to every one calling himself a soldier, and one appeals with confidence to all those who know what modern military organization should be, in favour of the English and European Unification systems.

SECTION III.

The meaning of Unification.

10. To many Military men of the old school and indeed to many army medical officers also there seems to be a want of grasp of what Medical unification really means. To many it seems to be simply not commissioning Medical Officers to individual battalions. To others it seems to be treating the sick in one large central hospital. It is neither one nor the other. The great end of unification as carried out in Germany, America and England is the training the medical service in peace for its duties in war. We may safely say that if in any army there is much divergence between its peace and its war routine, disaster is certain to occur when the change takes place.

11. In India at present we are working our hospitals on the regimental system, every battalion, Regiment or Battery has still its separate hospital wholly independent of each other. Thus I find 12 hospitals in the encampment of a single division or 48 in an Army Corps. In every garrison these petty divisions of the hospitals exist, although in every other Army and in every English non Indian garrison they have been abolished.

The Medical Department while serving in India is completely injured in its training for modern war and in its development of professional efficiency in peace by this system. In the first place in any campaign either in India or England, or elsewhere, Regimental hospitals could not be worked for even a single week without almost certain disaster. We know that in all English Campaigns, Divisional field hospitals will be the medical system. Yet India would have 48 hospitals in the front line of an Army Corps, and that without counting *ettapen* or base hospitals. In England and the Colonies every day the Medical Officers are working their hospitals in peace as they would in war; we in India are doing quite the reverse. We are to-day working in India on a wholly condemned system, and such being the case every day a Medical Officer spends in India is an injury to him because he cannot be trained in the English system.

So much for war organization. In peace the same ill is resulting. We still see in India detached hospitals for every battery of Artillery, Cavalry Regiment or Infantry Corps wholly independent of all medical supervision save once a year by the Deputy Surgeon Generals. We see medical officers of our service often of senior rank wasted in these petty battery establishments. Receiving no training in the large duties of their Department and becoming unfitted in consequence for the inspecting grade when their time of promotion comes. We see also, often in garrison young medical officers placed in detached battery hospitals and once placed there wholly free from inspection by the senior officers of their Department in the same garrison.

12. We may see also corps of infantry in charge of junior officers in a garrison. Batteries of artillery, very petty charges, in the hands of senior men, and in the end the efficiency of our officers is injured. We are not trained in a system that will work in the field, and on this account it is true and right to charge India with being to us in every way an injurious quarter.

The greatest evil that resulted from the old English regimental system was its ruinous effect on the senior medical officers, not yet promoted to the inspecting grades.

They never got any chance of training themselves for their new duties. They spent their years in petty little hospitals with their hands tied up in every way. Then when enfeebled and injured in their administrative powers they were, when old, granted promotion. Such men are little use. We want training to our duties as administrators, and that training is given in England by the garrison medical system.

Instead of having as of old in every garrison a crowd of officers idling their lives in petty Regimental Hospitals, all of equal powers, equal rank and equal duties, we have now in every garrison one man, the senior, administrating that garrison, dealing with every Medical question there, becoming a well qualified officer and fit for promotion for the higher grades, or at any rate being proved and tried to see if he has it in him to be efficient.

13. Such a man of old would have been kept in a regiment until the day of his promotion to the inspecting grades, and it would have been the merest fluke if he turned out a good man, because he would never have been tried, no one could tell what was in him and good as he might be the new duties would be at first very trying for him.

To promote the Surgeon Major of a Regiment to be Deputy Surgeon General in the old day at home, and still in India, was like sending a captain of a company to command a Division without any preliminary training. Have we not all seen Surgeons' Major in charge of petty regimental Hospitals up to the day they became Deputy Surgeons General.

Now, on the contrary by the European garrison system, one man is being trained in every garrison to deal with several regiments and large Medical questions, and in consequence he gets a chance of being efficient.

Further, in England a Senior Medical Officer in a garrison deals constantly with 10 or 12 Medical Officers, and a large force of non-commissioned officers and men of his corps. He learns to administrate, to supervise, and to control men.

14. These are duties which need training and practise. We do nothing of this kind in India. A man may come to India after

being Senior Medical Officer of a large English or Colonial garrison, to wither away into a useless officer of a petty battery hospital.

Such a system admits of no defence. It should not exist for one day, nor is there any occasion for it. It is perfectly possible without any expense, any injury to the soldier, or any disjoining of arrangements to introduce an English system in principle into India, and until it is done we will be kept back in the road to good work and efficient administration by our Indian tour of duty.

If we do not get a garrison organization there will be nothing whatever to prevent a Surgeon Major of standing in the Department being taken from the actual charge of four or five sick men in a battery hospital in India, and sent to be Deputy Surgeon General of an English Division in Roumelia, a post needing high training and tact.

We want an intervening duty between batteries and divisions of the army, as much as any military officer does, and that training is the medical charge of a garrison of two or three corps.

SECTION IV.

The Changes Necessary.

15. It is constantly advanced as an argument against Medical unification in India that the distances of the various barracks from a central hospital are too great to admit of such a system being introduced. Doubtless there are some stations in India where the distance is a drawback but what I desire most clearly to point out is that one Central Hospital although an immense advantage in administration and economy is by no means a *sine qua non* in the principle.

The basis of Medical unification is the centralization of the medical duties of each garrison in one man's hand, not in one central hospital. The hospitals may be far apart, may be scattered over a cantonment in any direction, what I desire to point out is that so long as they are under one administrative head, and open to the inspection and paramount control of the Senior Medical Officer in the garrison it matters little how far apart they are. Near or far they should still be garrison hospitals, being as it were mere scattered wards of one large hospital. This is the true principle at stake. This is what unification means.

16. That once granted it matters little save in expense how far apart they be. There is no particular reason why they should be closed up together into one consolidated mass, so long as they are practically one in administration.

What all unificationists inveigh against is the absolutely injurious effect the present Indian system has on all of us. Take Bareilly, or Fyzabad, or Lucknow, or Meerut, as an example. At Fyzabad we have a European Infantry Corps and a battery of Artillery, besides native troops. Now the Senior Medical Officer, who is in India a mere creature on paper, may be in charge of the Battery of Artillery with perhaps 3, or 4 or even 6 single men as a charge.

17. His whole time is supposed to be devoted to this paltry duty. He does not in any way enter into the organization or routine of the European Infantry Regimental Hospital, although it may be crowded with 100 sick. He has no power whatever of visiting that hospital. He dare not enter it without the sanction of the Commanding Officer of the Regiment. His whole time is wasted over his four or five sick men, and the Sanitary affairs of a Battery of 130 men. He has no officers under him. He has no training in any large administrative capacity. A young surgeon of a few years service may be in charge of the Infantry, he can in no way interfere. He cannot in any way supervise the routine of the hospital, nor give any order.

In the same way if a boy from Netley devoid of all Indian experience comes to the battery he is free from all inspection and control from the Senior Officer of his Department in the same garrison who may perhaps be in charge of the Infantry Corps. Such a system is ruinous.

It injures the Seniors by keeping them from experience in dealing with large questions, which must arise in the field and it injures the juniors by secluding them from inspection and direction by their seniors. Once a year it is true an Inspecting Officer comes, but it is not by such inspection good is done. It is by daily guidance, and frequent advice and direct orders too, such as only a man on the spot can give.

I say then that if we are to be made good army Doctors we should be unified in India as we have been in England.

Not by building extravagant hospitals, not by drawing the buildings close together, but by developing the existing Senior Medical Officer in each garrison into a real living entity with power to control and ability to direct. Such an officer would be a real aid to a Commanding Officer, would have at his grasp the whole medical details of the garrison, be able to exercise real sanitary supervision over the whole Cantonment and in fact be in reality and not in pretence a Senior Medical Officer.

In the same way at Lucknow, Mian Mir, Rawul Pindi, Meerut, or Umballa the authority of the Divisional Principal Medical Officer should be defined and more particularly limited to the Divisional work. Under him should be the garrison Senior Medical Officer dealing with the local hospitals and all local questions, of course under the eventual control of the P. M. O. of the Division.

19. But it is essential to have men in training and ready and able to take responsibility. Separated as we now are only in India we are injured in our efficiency, and one looks forward with dread to a campaign lest from sheer inexperience of dealing with large matters we are found wanting in men able to guide the Medical Corps. To day no man can say how any officer would turn out as senior in a Division in the field.

20. Then we must have a large field hospital and a separate organization, and is it fair and just to push us out into the field unorganized for our future work, we must train in peace for war, and can any soldier deny this. We alone of all the army in India seem to live in quite another atmosphere; viz. to live in peace wholly different from war, and how can such things end save in disaster. I propose then that in every Indian garrison the hospitals whether concentrated or detached be placed under one administrative head viz the Senior Medical Officer of the garrison. That with the Commanding Officer of the garrison we have full directing power in every way over every Medical Officer and subordinate of every grade in the garrison. That we detail and define the various duties of the officers and have full power when epidemics threaten to evacuate the troops from any hospital, to concentrate them in any hospital, and to utilise any hospital building for special disease. That all posting of officers to battalions and batteries while in garrison should cease and that a definite staff of

Doctors be posted to the Garrison. That over these officers and subordinates the Senior Medical officer should exercise his full power granted by the Royal warrant of 1877. That we be taught to obey this officer and to look to this officer for instruction or assistance in any case of doubt or uncertainty.

In fact that the English system of a single head be introduced.

21. I maintain that the responsibilities of such a post will develop good men. That no one will benefit by it more than the soldier and the army and the Commanding officer of the garrison. That we as a Department will be in far stricter discipline and more working order than now when we serve two masters and that by it a new start towards efficiency will be taken. For if a man fail in working in a garrison he can be detected and prevented doing still greater injury as a Divisional P. M. O. in the field. The authorities Medical and Military will soon find out the real men. Men in such posts soon sort themselves, the bad ones sink to the bottom, the good ones come to the top, but now with our petty little hospitals and narrow training we all in India float on a dead level of mediocrity. I feel certain men can and will be developed capable of any duty if only we get the chance of developing them. This work is going on in England, why should India stop the way.

If a hospital be near the Artillery Barracks keep it, if need be for the artillery ward of the garrison hospital. Then it is open to inspection by the Senior Medical Officer. Let the Sanitary charge of the Artillery and Infantry alike be the charge of the Senior Doctor, who through his juniors will make himself master of all details. It is the system in England and in Germany and no one can deny it is the true system. It is the same in peace and in war ; by no other means can Medical efficiency be developed.

22. When a battery or battalion marches away a certain fixed staff would march with them. While on the march this staff would be under the control of the Commanding Officer on the spot. When it marched into a new Cantonment the staff would take their places amongst the Garrison Medical Corps, according to their standing and everything would go on as before. No difficulty whatever exists in the way of its being carried out, no expense and no trouble to any one save the Senior Surgeons-Major, but they are men to be troubled, for out of that trouble comes in the end the power to master it. This system enables the fittest Doctor to survive, and that is what we want ; today we are in India only keeping every one in a state of mediocrity out of which no good, but much harm may come, then with free play to burst out and to grow, the good men will come to the front. Never at any time or in any country did we ever see Senior Surgeons Major in charge of battery hospitals as we do now in India. Even in the darkest days of the past such would never be allowed. Every duty now

done by the Medical Officer for the soldier can be done equally well, nay better by the garrison system than by the existing one; and every Sanitary duty or detail of daily routine required in Regimental Life can also be accomplished.

But in addition to all, we will be trained for good work and be made far and away better men than we now are. Further, and it is by no means unimportant, we will be assimilated to our English System; and that alone is a benefit.

Whenever uniformity can be secured between England and India in any army system it should be done. All change of system causes trouble and confusion and these should be reduced to a minimum. In case of medical officers sent out in time of war to India, the existence as now of two different systems would be disastrous.

What a comfort it will be when Cholera is threatening, to be able to evacuate any hospital by concentrating the garrison sick in one place, and keeping the empty hospital for those attacked with the disease. I maintain that if we get the hospitals put under one single authority the greatest comfort will be given to the sick by allowing special accomodation for special cases or special disease in every garrison.

23. To-day if two cases of Scarletina occur, one in each corps in a garrison both corps hospitals became poisoned, because no one now has power to concentrate all special diseases in one place owing to the Regimental detachment of buildings. In the same way in every corps in a garrison the want of lying-in-wards, and quiet wards for special cases exists because every corps has a petty little hospital attached to it for women, instead of there being one really good quiet hospital told off specially for such cases.

The Senior Medical Officer under the commandant of the garrison should have full power to allot the hospital accommodation to each disease, and much comfort would be given to all by such a power.

Gradually as new hospitals are built, and many such are needed, they can be so placed as to be convenient for garrison use, but this though an advantage is not essential.

24. Another great advantage of developing the position of Senior Medical Officer in each garrison is the power it gives the Surgeon General of assuring himself that Medical officers newly out from England and with no Indian experience shall not at first be put in positions needing any Indian experience such as the medical charge of corps or batteries.

It will always be possible so to post Medical officers arriving in the country that they will not be senior in a garrison, but will be under the supervision and control of officers of experience for, at any rate, sometime

after their arrival in the country. By this system their power of free action will be limited by having to refer to the Senior Medical Officer on the spot. To-day owing to our adhering to a practically regimental system the most inexperienced Medical Officer may be placed senior in a Regiment, and his recommendations lose force from his want of local knowledge. But by keeping him a year or so in a garrison, he soon learns the Indian routine, and is saved from all chance of error or misapprehension in his views of Indian Sanitary matters.

The saving of trouble to Medical officers by granting power to one controlling head to allot the garrison duties would be great. Decentralization and localization of duty would come into play, to our certain efficiency in every way.

Look at Dinapore with its Infantry and Artillery hospitals both in one building yet distinct in every way. Look at Lucknow with its two Infantry hospitals 50 yards apart yet wholly distinct in Staff, equipment, drugs, and routine. Look at Bareilly and Sitapur equally available for the new system. At Bareilly this summer when typhoid fever attacked the 2nd Queen's how easily could the infected cases have been removed to the Artillery hospital close by, and the ordinary sick of the Artillery treated in the Infantry hospital.

In the same way good ophthalmic wards, special wards for dangerous cases, can be allotted if the hospitals be under one head. Yet at Bareilly in the same building two female hospitals, one artillery, and one infantry, exist wholly distinct in staff, nurses, and servants. Yet from both one really good hospital could be made.

SECTION V.

Field Hospitals.

In India under existing rules every army corps will have 48 hospitals in the first line, wholly excluding *etappen* and base hospitals which in England, are equal to the number in the first line or for India 96 hospitals per army corps.

In England, and in all European campaigns every army corps will have 25 Field hospitals including *etappen* and base hospitals attached to it. Each hospital will be a perfect unit in itself and capable of accommodating 200 sick men. Each hospital has a staff of seven medical officers, with Captains and Lieutenants of orderlies acting as Quarter Masters and Paymasters and a full detail of non-commissioned officers and men. Of these 25 Hospitals, 12 are attached to the army in motion, and 13 are to be posted at the base of operations and along the *etappen* lines.

Of the 12 with the Army corps, 2 are posted to each Division, making six, and six are with the corps details in the second line, in reserve.

In India every division at present has 12 hospitals in the first line, vide Regulations for encampments in India plate No. 7, 1876.

All hospitals attached to divisions are fully equipped with transport, and able to move in any direction, and three of the six in the 2nd line are also fully equipped with transport.

The arrangement is that as soon as any of the field hospitals attached to divisions became filled either with wounded or sick drafted into it, it halts, ceases to belong to the division, and its place with the division is taken by one of the hospitals in reserve in the 2nd line which if necessary takes over its transport, and marches off with the division.

26. The halted hospital practically becomes one of the *etappen* hospitals, and the reserve may be again filled up from the 13 hospitals originally detailed for this duty.

A field hospital is a perfect unit, complete in every way. Its Medical Commanding Officer has full control over it in every way. In fact he has been trained for it in garrison in peace. It practically is simply a garrison hospital able to march.

It has its own Paymaster, Quartermaster, transport officer, carriage equipment as clearly told off as any battery of artillery.

We need the same arrangements made for India where even with our 48 hospitals per army corps we have no transport officers, quartermasters, paymasters, nor trained staff. We want to be told what an

Indian field hospital will be, and how it is to be organized, how many officers are to be posted to it. How many subordinates, who is to be its Quartermaster, who is to enforce discipline, who is to be its transport officer, what number will be attached to each Division, where the orderlies and servants are to come from. These things should be as clear as noonday. They should be known to the most junior officer of the Medical corps.

When war comes it is too late to tell us. We should know it in peace, and work the same system in peace, if we do not we shall certainly go to grief in war.

27. If it is thought that an English field hospital is too large for India let it be reduced to fewer officers and a smaller unit, but it should be self contained, complete, a fixed and definite entity not capable of being a mistake in any way.

This is the secret of German efficiency. Everything is ready and known. No man unless a heaven born genius can devise schemes for an army off hand.

Even if he does devise them no one can be trained at once to carry out his views which must be quite novel. It is practice makes even the cleverest perfect in this as in everything, and without practice he cannot be perfect. It should be possible at Lucknow, Meerut, Umballa, Meerut, and in fact at a number of garrisons to mobilize a field hospital under canvas every cold weather for a few weeks, and actually treat the sick in it, we can then find out the hitches and errors and have them corrected.

It is a perfect treat to study the arrangements of an English or German field hospital. Everything is foreseen and provided for, but I am unable to say where we can find out what an Indian, field hospital is to be. Great or small, divisible or undivisible, it should be a perfect unit and be wholly self contained.

Quite apart from these field hospitals is the regimental Medical officer attached for the campaign to the corps. He has no hospital, simply a tent and a cart for a few seedy men who would be able in a day or two to return to duty.

The hospital should be quite separate from the Regimental aid. The Surgeon with the Corps goes with it everywhere it goes, in the first medical aid the sick or wounded soldier receives, if the man is merely indisposed he treats him in the lines or regimental camp, if he is ill he is sent to hospital. We want then to be told what our field hospitals will be, and then we want to try them, work them in peace, and see if they will work without a hitch.

We cannot at this hour of the day go to war with 12 hospitals per division while every other nation has but two, nor take into the field 48 hospitals for an army corps and an equal number along the communications. Such a system would collapse in a week. Yet where are our orders for a better system.

SECTION VI.

The Bearer Column of an Army Corps.

An English Army Corps numbers about 37,000 men. Forming part of its Medical arrangements is a "bearer column" consisting of four "bearer companies."

Of these four companies one is attached to each of the three divisions, and half a company each to the Cavalry Division and the Corps Details.

What is a bearer Company ?

We have pointed out that in Europe no regimental hospitals exist.

The field hospitals are perfect units, in themselves but they do nothing whatever to lift wounded men from the field. That is a special duty, provided for by regimental bearers, and the bearer company or sanitary detachment of the Germans.

Each English battalion has four men per company trained to remove wounded men from the field, and partially bind up their wounds. These men work under the Medical Officer with the battalion. They wear its uniform and are in every way part of the regiment. They constitute the Regimental aid. But in addition to them there is a divisional bearer company of 7 Medical Officers and some 130 men of the Army Hospital Corps organized as a complete divisional unit whose duty it is to remove the wounded from the field, dress them at the field dressing stations, place them in Ambulance wagons and deposit them at the door of the field hospitals, which duty being done they again return to their Division and are ready to march off with it almost at once. Had such a system been in force at the Alma Lord Raglan could have marched at once after the battle. These companies are perfect self contained units of which each Division has one, composed of medical officers, officers of orderlies and men of the hospital corps. They have stretchers, a large number of Ambulance wagons, tents for operating in, dressings for the wounded and nourishing food for them. These companies patrol the whole field of battle, and remove and guard all wounded men. By constant training in peace they become highly efficient and it is impossible to say what would have been the result following the battle of the Alma, if in 1854 we had had such an organization. We could have marched in one hour after the hill was carried.

We want such men in India. We want our "*galla*" establishments of Doolie bearers, supplemented by Ambulance waggons, trained to remove the wounded from the field.

29. We want them to be drilled and disciplined. Taught to work with stretchers, doolies and ambulances. To pitch a dressing station. To feed the wounded soldier on the field with water and soup.

To be trained and dressed so as to be easily recognised and to be formed into a real ambulance corps or bearer company. We want good ambulance carts, light and strong, we want litters and caçolets; we want stretchers and mule caçolets for mountain warfare on the frontiers. We want a back bone or cadre of European soldiers of the Subordinate Medical Department to work with these doolie companies.

The units of organization we want clearly defined, placed under our control, trained every cold season in every Indian garrison and taught to be efficient.

To day these men are unorganized and grossly ignorant.

They know nothing of their work and never will, unless trained.

We want a backbone of European Non-Commissioned Officers and men on the cadre of the company to give stability to the organization, and to aid in the field. Our Subordinate Medical Department are too weak to be enough for such a duty, and as in the Bengal Sappers and Miners a certain number of European soldiers are attached to each company, so we want the same.

30. We want a definite table drawn up of what the strength a bearer company should be for a Division.

The number of Medical Officers it requires, the number of Medical Subordinates needed whether for transport, payment or storekeeping duties.

We also need a certain trained cadre of European soldiers to work with this company.

Every year at the headquarters of every division or district this company would be mobilized.

They should be drilled, clothed and disciplined like sepoy.

In the summer they would pull the punkahs, but still could be kept in a more or less disciplined state. Weakly and delicate men should be cast out from the bearers and all men unable for the duties of a campaign.

At out stations where regiments are stationed the "*galla*" establishment, even if two few to make a bearer company, should be organized into a half or even quarter company, but organized it should be, and trained and drilled.

This cadre in the event of war would be expanded by the admission of civil doolie bearers and could easily be extended to double or treble

its peace strength. It would need tents like a sepoy corps, and when war came it would be placed wholly under the Medical Officers,

Ambulance carts would form a definite part of this company, and it is hopeless to try to get on without them.

Every day doolies are becoming rarer in India and in ten years will be still more rare. But cart roads and good country roads will every day be more common, hence we need wagons for our wounded men. Now we have hardly any. Wagons once made up would last for years, and the cattle to drag them could easily be hired or bought.

Every garrison should have its certain reserve of such wagons, and they would doubtless be used from time to time at cold weather field days.

I often wish that the moveable column of a Cantonment would parade once a month and march a few miles out of the garrison ready for the field. Merely putting such a thing in orders is quite a matter of form. But if it paraded complete in every department a good opportunity would be given to see its defects and its needs.

As the public cattle are mustered once a month advantage might be taken of the muster day for this marching out practice.

With it the Medical Corps would parade, whether as regards, bearer company, field hospital or otherwise. For mountain warfare mule litters and caçolets are needed as in every European army, and I suppose the cumbersome doolie will no more be seen in the Khyber or Khoord Kabul passes. One mule can carry two wounded men, why not use them?

The moment we come to detail a moveable column, our regimental hospital system goes to grief. If two companies of Infantry and a couple of guns and a squadron go out are they each to have a separate hospital. This would be impossible. Yet the gunner doctor if he goes out with the force leaves his hospital uncared for. At once another officer would have to be detached for this work. The moment field service begins our existing system falls through. The very tents for the field hospital would have to come from different sources, likewise the medicines and the servants. Having to keep the artillery hospital in cantonments working for the few sick that would remain entails all this. No one has power to send them to the Infantry Hospital.

SECTION VII.

Regimental aid to wounded.

32. We have described the bearer Company or Divisional aid to the wounded in battle. But there is the Regimental aid to be still dealt with.

We have copied from the German Medical system the institution of Regimental bearers. Every German battalion has its "Sanitary Detachment," that is to say a body of two, and sometimes four men per company trained to lift the regimental wounded off the field with stretchers, to bind up their wounds roughly and to carry them to either the dressing station of the bearer company or directly to the field hospital in rear. These men work under the Medical Officer attached to the corps for duty.

These men carry no rifles while on the duty, but have stretchers one per company always with the company and carried with its baggage. Wherever a company goes then either on outpost, picket or other duty it has at any rate four men trained to dress the wounded. This system is in full force in England. For India we want the same thing in principle. The subordinate Medical Department is too weak in India to give this aid by regiments. What is wanted is a special detail of doolies for each regiment, or of stretchers, and an ambulance wagon, with which these English soldiers even if not carrying the wounded themselves would superintend the carrying away of the wounded by the doolie bearers.

In every engagement soldiers will fall out to assist a wounded man, either from love of their comrade or from not being desirous of running any risk for their lives. It is better then to legalize this practise by detailing two or four men per company for the duty. These men will then be the only ones allowed to fall out. Otherwise many dodgers will seize the excuse to get away. This is the case in every army. These men should be lectured and taught every year *how* to lift the wounded, to pack the Ambulances, to apply tourniquets and in every way to aid the regimental Medical Officer.

Whether in peace or in war they would be useful to a corps.

I find men take an interest in this kind of work, and no officer should object to the loss of a few men for so useful a purpose. In petty engagements and skirmishes and at the outposts the Regimental bearers are sufficient for lifting the wounded, but in all larger fights the divisional bearer company would be called to take part.

33. A step towards this system might be made if we had unification, by making the doolie bearers who now are attached to the Regimental Hospitals, and who wait for sick at the quarter guard, part of the Regimental servants paid and mustered by the Quarter Master.

These men well trained and taught would work with the European soldiers at the wounded, and would be the cadre of the Regimental Dhoolie bearers, to be expanded in taking the field. If station hospitals are far from barracks a doolie or two extra would obviate much difficulty. I would supply the stretchers even in peace to the companies in India because there are many occasions even in peace when the men could use them as at night or in the cold season to carry men to hospital and it would gradually familiarize men with them and teach them to use them now and then, instead of always trusting to native doolie bearers as they now do. They are so light and handy as to be easily carried on a camel with the company tents.

A Non-Commissioned Officer or two should also be trained to take charge of the bearers under the Medical Officer.

34. I would have these men even in native corps, and give them the stretchers also. They are never in the way, and men would soon find occasion to use them. No reason exists why a couple of sepoy per company, should not be trained in this wound binding duty. It is useless training havildars and duffedars because in war these men are fully employed with the fighting men. It is a batch of sixteen sepoy who need to be trained and a couple of naiks or havildars to superintend.

As I will point out further on, I believe from the men in the European Corps trained to this wounded aiding work we can gradually get the subordinate Medical Department recruited with valuable subordinates.

SECTION VIII.

Doolies, Ambulances Caçolets, Litters.

35. For our army in India, we need several modes of carrying the sick and wounded.

1st. In the plains the Dhoolie will always hold a certain place in removing wounded from the field to the hospitals or dressing places.

Surgeon Major Bourke's Dhoolie is a very admirable contrivance.

It is light, portable, folds up and acts as a bedstead and stretcher. We need many hundred of them for the army in India. The existing Dhoolie is simply odious from its bulk, weight and non-compressibility.

2nd. We need ambulance waggons. These should be light, strong, capable of holding six men, or at least four, two lying down and two sitting up. They should be light so as to be drawn by ordinary bullocks, and strong so as to go over cross country roads.

It is hopeless to go on a campaign without them.

All work of evacuation of hospitals and much of the carrying to hospitals must be done by them.

The existing pattern seems to be very cumbersome and heavy. They alone seem a load for a pair of bullocks.

3rd. Caçolets are simply folding chairs strapped on like paniers to a mule, or perhaps a camel. They would do for mountain campaigns, and our mule batteries are a model to base them upon. One mule carries two slightly wounded or ailing men, and I suppose camel caçolets could be used in India. In Egypt the French army used them. The experiment might be tried in India with mules and camels.

An English "bearer company" has 50 caccolets and 26 litters, when engaged in mountain warfare. Such a company would do well on the north west frontier.

4th. Litters are folding bedsteads giving lying down accommodation for the sick and wounded.

They too are strapped upon mules. They should be utilized in Mountain warfare.

26 Litters and 50 caçolets are the equipment of an English bearer company for mountain warfare.

Camel Kajawas or paniers might also be of use in carrying ailing or slightly wounded men.

Whatever carriage we could use in war ought to be carried

in peace ; and in the cold weather field days there is no reason why they should not be used. Such parades are very useful to every medical officer and to the men of the Hospital corps. It seems to be a pity they are not the rule. Sham wounded should be picked up and removed eventually to the garrison hospitals.

SECTION IX.

The Subordinate Medical Department.

36. The subordinate Medical Department of the Army in India is supposed to correspond with our English Army Hospital Corps. The organization of the Subordinate Medical Department in India is a subject well worthy of consideration, the time has now arrived to introduce some changes in it. By some slight modifications in its mode of recruiting and training, it might be made a much more useful body to us all than it is at present ; and the whole of the subordinate duty in a hospital of every description whether as regards the nursing of the sick, the preparation of statistics, the rationing, and the custody of stores, and the maintenance of discipline might be entrusted to it. To-day its duties are quite too narrow. At present the preparation of statistics forms no parts of its duties, being given over to a sergeant fresh from the parade ground. The custody of stores in every way its legitimate duty, and performed, without an exception, by the corresponding branch of every European Army including our own is in the hands of the Commissariat Department. The discipline is in the hands of the Hospital sergeant, and there is no clear order defining the responsibility of the medical subordinates acting as ward masters—for the equipment of their wards. I believe it possible by recasting the duties to make it possible for the Sub-Medical Department to be as useful to us in our Indian Hospitals as the Army Hospital Corps is to us in England, which it certainly is not at present. To-day it seems to me that we are carrying out a course of education for those subordinates of much too elaborate and expensive a character, considering that for the greater part of their life their duty is merely routine, and to carry out definite and clear orders as regards the compounding of drugs, and nursing details given by the medical officers under whom they are serving. The loss of service to the state and the great expense incurred by educating these young boys, called by Sir William Muir “ lads of tender years” for three years at the Medical College in Calcutta hardly seems to be justified in consideration of the very routine duties required of them afterwards in the Army. We do not require a body of men who believe themselves to be almost physicians and surgeons, to whom the actual *nursing* of the sick soldier, and the custody of equipment constantly, seems to be considered a demeaning work. Did we instead of these lads, enlist a body of men of maturer years, fit for field service and more accustomed to discipline, it would be possible at much less expense to develop a set of officials perfectly competent to deal with such sudden emergencies as may arise in a Hospital before the arrival of a medical officer and who would really be nurses and compounders.

37. I maintain that to give us a number of young country born boys, wholly undisciplined, often of mixed parentage, without prestige or authority amongst the men, and who refuse to perform all the subordinate duties of a hospital, instead of being a boon and an assistance to us, is a dead weight and a drawback. Having before one's eyes the state of

efficiency to which the English Army Hospital Corps drawn from the ranks of the army has risen, I would press upon the authorities that it seems to me we are making a mistake in India in not utilising as subordinates in our hospitals, men drawn from the ranks of the army, in the same way that the subordinate officials of the Public Works Department, the Commissariat Department and the Barrack Department, are obtained. Why these Departments should be permitted to recruit amongst the well disciplined ranks of the army and to skim off as it were the cream in conduct and education of the European non-commissioned officers and men for their services, while the same boon is refused to the Medical Service is more than I can understand. I maintain it is essential for the efficiency of the Medical Service of the Army that the English and Indian systems in the hospitals should be practically the same. The two systems are now so divergent that it takes fully one year before a Medical Officer new to the country can untangle the threads of our confused Indian system.

I propose to simplify it in a great degree. The main outline of my scheme would be to recruit the ranks of the Sub-Medical Department from the non-commissioned officers and men of the Army, to diminish to some extent the number of warrant officers while increasing their pay, and to develop a class of trustworthy non-commissioned officers who would carry out all the subordinate hospital duties including those of the Purveyor; whose post I would abolish, to the great comfort of the Commissariat Department and to the certain increase and efficiency of the hospital working.

Let us glance in the first instance at the existing subordinate staff of an ordinary Infantry hospital in India; in the first place there is the Apothecary a well paid Warrant Officer on whose shoulders I would lay a far heavier burden of non-professional responsibility. Then there is the Assistant Apothecary, now without any responsibility, also a Warrant Officer to whom I would allot a further defined responsibility of a certain nature. Then there comes the Hospital Sergeant that extraordinary remains of an extinct period, who exists only in India, who, the moment a corps embarks for England is deprived at once of his rank and pay as Staff Sergeant, and returns to his duty in the ranks, who while wholly untrained professionally is the responsible compiler of abstruse medical statistics to which is combined the charge of the hospital furniture; why I know not. There is then the hospital European writer, to whom under my scheme I would assign very clear duties. There is then the Purveyor or Hospital Gomashtha, a non-descript creature owning a double allegiance to the Medical and Commissariat Departments and equally unloved by both, whom I propose to abolish altogether, utilizing his pay to increase the attractions of the sub-medical Department as a field of service for the rank and file of the army.

38. Then there come three hospital apprentices called by Sir William Muir "lads of tender years" on whose boyish and undeveloped shoulders the strain of discipline rests uneasily, who have neither power

nor influence over the British soldier in hospital and who are physically unfit for the hardships of a campaign, and whom I would supersede by European soldiers. Last but not least come those two or three European Orderlies wholly unsanctioned by Regulation to whose devotion and kindly assistance the sick English Soldier in India owes so much, and without whom the responsibilities and the cares of the Medical Officer for his sick men would be largely increased. I will now state a plan which I claim to be more rational as well as economical and far more easily understood than the present cloudy system. Before proceeding one step further I would say that the three years now spent in the medical College is, considering the average duties we require of our medical subordinates, practically wasted time. I think all medical officers will agree with me that we do not want pseudo physicians, pseudo surgeons serving under us in our hospitals. A certain amount of medical training is needed, doubtless, for all hospital subordinates, but practically what we want is, devoted nurses, intelligent clerks and trustworthy store-keepers. The medical knowledge I would limit to a thoroughly practical training in the compounding of drugs a duty learned in six months by the corporals of the Army Hospital Corps in England, the application of tourniquets and dressings to wounded men in the field, such as is given to the privates, corporals and sergeants of the Army Hospital Corps in England, and finally as a qualification for promotion to the warrant grade a special course, not exceeding one year's duration, in the early treatment of sunstroke, epleptic seizures, and those malarious affections so common in the East. This granted, I would deal in the first instance with the recruiting of the Department.

39. I would cease to recruit from the children of the Martiniere or such institutions.

I would legitimize the employment which must now be winked at, of three European Orderlies in a hospital of the same size as an existing Infantry hospital, to be increased in proportion for field or station hospitals of larger size. I would point out that if, as seems to me very necessary, two men per company, as in England and Germany, are trained to assist the wounded in the battle field, the medical officer carrying out such instruction would often be able to single out intelligent men who seemed to take a fancy to such work and might induce them to volunteer for the Subordinate Medical Department. In addition, we are every day chancing on really good and steady men who come to us as casual nurses in our army hospitals to look after those special cases which humanity forbids us trusting to our present indifferent, and untrained, and ill paid native servants. These sources of recruiting the Subordinate Medical Department from the ranks of the army, would also be supplemented by many men now in the ranks of the army with some experience of chemists work in civil life whom the daily routine of monotonous parades and ever recurring guard duty renders the victims of *ennui*. Such men, whether privates or Non-Commissioned Officers, I would train in the wards for the posts of Ward Masters and Assistant Ward Masters, their duties being not the origination of fresh medical

treatment, but the careful carrying out of the Medical officers clear orders and the nursing of the sick in the strict sense of that term, a duty now almost wholly in abeyance throughout a great part of India. These men full of sympathy with the soldier, bound to him by the ties of comradeship and duty, respected by him as the agents of the authority they have always been accustomed to obey, not too full of prejudices to descend to nurses work would bring into the wards of our army hospitals in India, literally a new life. The medical officers of the army, free from that terrible weight of anxiety that now hangs over them could leave their hospitals in the intervals of their visits without any dread of neglect of duty, of orders ill obeyed or of their medical treatments being meddled with by the rash interference of partially trained men who may mar, by their theories and practice, the work of a physician.

40. These men would supersede the existing hospital apprentice class, a body of youths too full of prejudices and ideas of self importance to nurse the sick men, to take charge of the ward equipment, and too little thought of by the private soldier to be obeyed with alacrity. These Non-Commissioned officers and men I would charge with the custody of the equipment of their wards as is the case in England, they would also carry out all minor dressing and be responsible for the nursing and discipline of the patients. Their education in their duty would be carried out by weekly lectures such as we now give to the thoughtless boys who form the hospital apprentice class, and if we found that these men were indifferent, lazy or unsuited for hospital duties it would be possible without any trouble whatever to relegate them to their regiments and to their duty as soldiers of the line. This coercive measure alone would hang over the Non-Commissioned ward master throughout the whole period of his service, and no false theory of humanity would interfere, as it now so often does, with the subordinate Medical Department in getting a man dismissed from the service, dreading lest without employment the man so dismissed should sink into a poverty stricken condition. These ward masters would not compound medicines, they would be simply issuers, as at Home, of medicines already compounded by one responsible compounder on whose shoulders, as I would explain hereafter, the whole custody of drugs and instruments would rest. From time to time such ward masters, already taught the theoretical principles of compounding, would be placed in the dispensary and carefully taught under the supervision of the compounder who would still be wholly responsible for the accurate compounding of the medicines. This, accurate defining of the responsibility, for the compounding would set at rest the irregular existing custom by which the apothecary, the assistant apothecary, the three hospital apprentices and perhaps at times the so-called native compounders and dressers all take a share in the compounding work, rendering it most difficult to individualize the responsibility, when any error is made. We thus supersede the apprentices by soldiers from the ranks.

We now advance to the assistant apothecary whom I propose to charge with the compounding duties, the custody of the drug

and instruments, the training of other compounders and the responsibility, of detaining until the arrival of the Medical Officer such urgent cases of illness as might arrive at the hospital in the intervals of the medical officers visits, a duty he would share in turn with the apothecary or passed non-commissioned ward masters of the hospital. To qualify for this warrant grade and its increased responsibilities a special course of instruction and, an examination would be essential for the non-commissioned ward masters ; but I think that at the very utmost, one year would be ample for such a course.

42. The warrant grade would under this system of a longer pause in the Non-Commissioned ranks be given to men of greater age and more accustomed to responsibility than under the existing system, by which a number of men still quite young are thrust rapidly into the warrant grade, a rank which renders it almost impossible for them, in view of their warrant position, to take part in the nursing details of the sick, and which they accordingly do not share in. I believe it would be perfectly possible for the Assistant Apothecary to be placed in entire charge of the Dispensary and its medical stores and also for him to give orders to the ward masters for the temporary application of remedies to urgent cases arriving at hospital during the time that elapses till the medical officer is called. The Assistant Apothecary has now no responsibility of any kind save compounding for a ward or two, and taking alternate duty, but by this proposed system he would advance from the charge of a ward as a ward master to that of the charge of the drugs, and instruments as Assistant Apothecary. By this localization of responsibility for drugs and all documents belonging to them on the Assistant Apothecary, I relieve the Apothecary from his existing charge of those materials, freeing the ground for the imposal of new responsibilities with which I propose to invest him. We will now leave for a time the purely medical side of the administration and turn to the consideration of the Hospital Sergeant, the writer, and the Purveyor. The Hospital soldier writer and the Hospital Sergeant now work as a rule in the one office, but I propose to separate their duties thoroughly. My desire is to transfer the preparation of the diet rolls, the transport documents, the muster rolls, ration returns and superintendence of cooking from being the direct work of the apothecary and writer, to the Hospital Sergeant in addition to the new duties I propose for the latter, which I may say amount to making him, (the Hospital Sergeant,) practically the Steward or Quarter-Master Sergeant of the Hospital under the Apothecary. I would make the Apothecary responsible for the Medical statistics of the hospital, giving him as an assistant for this duty the hospital soldier writer, who by existing rules may be a non-commissioned officer of the army, and whom I would admit into the Sub-Medical Department. It is essential to point out that the preparation of statistical returns, dealing as they do with the classification of abstruse diseases, needs a certain amount of professional training, and medical officers must be daily struck by the incongruity of the system which hands over to the apothecary, supposed to be a professional man, the preparation

of the very simple rationing documents, while to the hospital sergeant, a man fresh from the parade ground and under existing rules, guiltless of all professional knowledge, is entrusted the preparation of documents bristling with abstruse and classic names of which he never heard before.

43. Indeed we may ask how did this extraordinary anomaly arise that the hospital sergeant should be entrusted with duties so wholly professional in their nature, while the apothecary, a man of more or less professional position, busies himself all the long day with totalling up the number of ounces of mutton and beef in the hospital diets. It is a survival of the far off past in India, when the Honourable East India Company existed and hired from the Crown so many battalions of English soldiers. They thought little, it would seem, of statistics, of sickness or of death. The soldier might come or go, might live or die, it mattered little by comparison to them. They demanded no statistical returns of his living or dying, but they dwelt with astonishing eagerness on the ounces of butter or pints of lime juice he drank while sick in hospital. As is well known, no inspecting officers of the Army Medical Department, bar one, only served in Bengal in the old days. To him as a King's, or Queen's, officer the statistical returns of the health of the Army were sent for the information of the Home Authorities and as they were called "Queens returns" the duty of preparing them devolved on the Queen's Medical officers and the Hospital Sergeant who formed the Royal administration of the hospitals in India. The Company had inspecting medical officers of their own in every division and circle in the country, these officers although they were powerless to interfere in the medical treatments or duties of the Queen's Hospitals reigned with a despotic sway over the lemons and the butter, and stories still linger in the traditions of hospitals, of scenes that used to occur when an inspecting Medical Officer of the Indian Army came annually to total up the expenditure of these valuable items. The subordinate Medical Department being in those by gone days "Company's Servants" took neither hand nor part in the preparation of these "Queens Returns" which were solely for the Royal Authorities in London; and today twenty years after the extinction of the Company and the abolition of its rule the custom still survives to puzzle every Queen's Medical Officer landing in the country, who strives in vain to discover why the apothecary with three years of College training and encouraged to think himself almost a physician, totals up the weights of beef and mutton in the diets, while the Hospital Sergeant fresh from the parade ground blunders every Friday over the Statistical Medical papers, thinking whether "Psoriasis" means sore eyes and what is the meaning of anæmia or Impetigo. Common sense would seem to say that a sergeant accustomed to the ration returns of his company could turn far more readily to the totalling up of hospital diets than the preparation of abstruse Medical Returns. The existence of this anomaly seems indefensible, and might be changed tomorrow, with great comfort to every body.

44. I maintain that by placing the existing soldier writer under the Apothecary and making the Apothecary responsible for the classification of disease documents, great trouble would be saved to the medical officers. The existing writer simply would become the clerk of the hospital, dealing, under the Apothecary and Medical Officers with that quite inconsiderable amount of correspondence and writing which would remain to be transacted when all documents connected with the pay, muster rolls, ration returns, furniture and equipment, transport and conservancy were transferred *en masse* as allied subjects to the Hospital Sergeant in the new sphere I allot to him as Steward or Quarter-Master Sergeant of the Hospital, subordinate in every way to the responsible official the future apothecary will become. The apothecary would be freed also from the preparing of papers about the medicine expenditure, by the assistant apothecary.

Up to the year 1868 a system of employing the Medical Subordinates as hospital stewards obtained in our hospitals in India. They were of warrant grade, often senior to the apothecary, and were responsible to the Officer in Medical Charge of the Regiment only. The fault of such a system was that their rank was too high and they were supposed to be well trained Medical Subordinates, while the work they performed was wholly unprofessional and they were not subordinate to the apothecary. I maintain that the duties of a hospital steward do not require any warrant rank and only a very slight medical training, and that many trustworthy steady men in the non-commissioned ranks of the army who did not care much for nursing duties in the wards, would enter the Subordinate Medical Department and be glad to put in their service as stewards in the Hospital store-room.

45. To my mind one marked defect of the old steward system in India was in not thoroughly subordinating the steward to the apothecary, and in not forcing on the Apothecary a supervising responsibility for the safe custody of the stores. The Apothecary, with very ample leisure, residing as he does on the premises of the hospital, visiting every part of it daily as he is required to do, would have been far better able to supervise the safe custody of the stores than the Medical Officer who lives away from the Hospital premises and who only visits it at stated periods. We see every day in India in other Departments of the public service, non-commissioned and warrant officers not so well paid as the Sub-Medical Department, occupying positions of far greater trust and responsibility as regards the custody of public property than any Hospital Sergeant or Apothecary, under my system, will ever be required to undertake. I suppose equally trustworthy men can be developed in the Sub-Medical Department of the future. Advancing a step beyond the hospital sergeant we come to the existing Native Gomashta, called the Purveyor, perhaps the most inefficient servant in any Department of the public service. I have never heard any Medical Officer or Commissariat Officer speak well of these officials. Their continued blunderings, their constant mistakes, their apathy in

the discharge of their duties, and their want of discipline, all render them dead weights and not assistance in hospital working. They cause us infinite bother. I maintain that we can abolish these men altogether thus saving some 50 rupees a month in every battery and regimental hospital in India, and that the Hospital Sergeant now employed in statistics can take their place. The hospital sergeant although the actual store keeper, would not be the solely responsible person for the stores, but would be in every way subordinate to the Apothecary, who has good pay, ample leisure for the work, and who being constantly on the spot in the hospital I would make responsible for all stores and equipments save, only and except, the medical appliances and instruments, which as we have before pointed out would become the charge of the assistant Apothecary. That the apothecary will have ample leisure for this work can easily be shown. In the first place we transfer to the Hospital Sergeant, as the steward of the future, the whole task of the preparation of the dieting, transport, pay and muster rolls of the hospital, now the apothecary's work; secondly, we transfer to the Assistant Apothecary the duty of preparing all documents connected with the medical stores, expenditure of medicines and custody of instruments also the apothecary work. To the writer we have given the statistical duties under the apothecary, who, at a word, becomes a supervising officer of all sub-departments of the hospital. I do not require him to actually prepare any documents, he simply examines them when prepared. I do not ask him to have actual custody of any stores, but give him a subordinate store-keeper, the correct discharge of whose duties he must supervise. I do not ask him to compound any medicine but to exercise under the Medical Officer the supervision of its compounding. When we remember that every ward master should be responsible for the custody of all furniture and equipment actually in his ward, that the compounder would be responsible for all equipment in the dispensary, that the writer or clerk would be responsible for all equipment in the office, and that to guard the unissued stores in the hospital store room we give him a non-commissioned officer as his executive, the responsibility which at first might seem something, dwindles down into a very mild affair. It would be possible also from the money saved to the state, by the abolition of the existing Purveyors to rise the charge pay of apothecaries from the existing 30 rupees to 50 rupees per mensem or even a larger sum. I believe further that if a garrison organisation is given to the medical department in India the total number of apothecaries might with advantage be diminished to one per garrison, and the money devoted to the payment of a small number of eight Senior Apothecaries, one of whom I would attach to the office of every Deputy Surgeon General of a circle in India.

46. These officers would occupy a highly respectable position, would be the Quarter Masters and Circle Store Inspectors of all hospital equipment and could also be the channel of communication between the station apothecaries and the commissariat department and assist the P. M. O's. of Circle in statistical work. We thus free the

officers of the Medical Department in India as in England from all responsibility for the custody of hospital equipment, developing for such duties the officials of the Sub-Medical Department. The Apothecary of the Garrison Hospital would still be required to afford medical aid to cases reported sick on emergencies, pending the arrival of the Medical Officer on duty. If we read over a list of duties required of the existing apothecaries in hospitals we find much room for criticism.

47. In the first place he is ordered to be present when the Medical Officer in Charge inspects the fresh sick in the morning and take down in the prescription book the orders issued for their treatment. This duty which is performed in the wards by junior hospital apothecaries and in England by non-commissioned ward masters does not, we may be quite certain, require high professional training. It is simply and solely a matter of writing and routine, when the sick go to the dispensary for the medicine thus ordered, the medicines are rarely if ever compounded by the apothecary himself, nor need they be so under my system as we have already placed a compounder in the dispensary for that purpose. He is then directed to accompany the Medical Officer in his visit to the wards and should presumably act as ward master of the Senior Doctor's ward; yet for this ward I have rarely seen him compound physic, and he generally delegates this duty to some of the boy apprentices. He is further directed to have a knowledge of all the cases in hospital, a duty it seems to me to be hopeless to expect of him, considering that he does not visit the wards with each individual Medical Officer, that he has no access to their case books or medical records, that he has not the leisure to examine the cases thoroughly on his own account, that his daily routine of blindly carrying out orders for the treatment of disease without having explained to him the principles that guide the Medical Officer in his treatment of the cases, paralyses his medical knowledge. I think that it is open to comment whether an Apothecary should have any authority to interfere in the treatment of any ward sick, save only on the rarest emergencies, when the Medical Officer on duty cannot be obtained and time admits of no delay. Such cases occur once in a series of years in Army Hospitals.

48. Considering that the medical officers see all their cases in the morning, again in the evening, and that during the day it is the custom in serious cases for the Medical Officer to visit them frequently, it is perfectly plain that occasions when benefit can be derived from any outside medical action on the apothecary's part will be few and far between; and two men rarely treat a case in the same manner. He should no doubt have a general surveillance of the Hospital, take a certain share of remaining on duty with the assistant apothecary, so as to be able to afford simple treatment to cases arriving at the hospital, pending the arrival of the Medical Officer on duty. Of course in such tiny hospitals, as that of a Battery of Artillery, if they remain, these fine distinctions of duty would not be required. The assistant apothecary himself would compound the five or six prescriptions which

form the daily routine of these petty hospitals. The existing hospital sergeant of a battery hospital would be changed to an Assistant Steward, subordinate to and in every way under the assistant apothecary, who would be practically the ward master of a detached ward which is about all a battery hospital really is. The Assistant Apothecary freed from the diet rolls would be responsible for the Statistics. And the hospital sergeant admitted into the subordinate Department and converted into a steward would supersede and abolish the existing purveyor, whose pay would be a credit in the accounts of the Medical Department. The assistant apothecary of such a little hospital would be responsible for the stores.

49. It would be of great advantage to put the subordinate Medical Department through a course of bearer drill, the handling of stretchers, caçolets, litters, Ambulance wagons, the formation of dressing stations, the arrangement of a field hospital; in all of which duties it is not too much to say, they are far behind in point of efficiency to even a corporal of the English Army Hospital Corps. Whether that instruction should be given in a Central Garrison in India which might at the same time be utilized as a training school for the native servants is a question to be discussed.

50. The dress of the subordinate medical department should be assimilated in every way to that of the English Army Hospital Corps to which they will be in every way similar. There is one point which may be noticed in the interior economy of hospitals in India, there is no provision made for the custody of men's kits in the hospital. They remain with their companies, but in any field or general hospital it should not be forgotten that a pack store keeper as in England would have to be provided for. A Non-Commissioned Officer serving under the Steward would be suitable for the duty. At present a certain number of the senior officials of the Subordinate Medical Department take medical charge of small civil stations. With the separation that must eventually take place between the Civil and Military Medical Services in India, this field of promotion will be cut off from the Sub-Medical Department which will become a wholly military body, which seems to me to be an argument against the long College Course now given and in favor of the development of the grade of divisional apothecaries attached with good pay and position to the Deputy-Surgeon General's Offices of each circle.

51. Whether these views about the recruiting of the Subordinate Medical Department be acceptable or not, there is no doubt the subject needs to be dealt with. No Non-Commissioned Officer will now accept the perfectly hopeless position of hospital sergeant. He is quite ruined by doing so, for this rank exists only in India, leads to no promotion, and he is at once reduced to a platoon sergeant on going home. He can never become Sergeant Major, or ever get a commission.

He thus loses all chance of a good pension because the English pension rules do not include hospital sergeants who at home of course

are all embodied in the Hospital Corps. Observe further the moment a regiment arrives in India one has to strive to coax and induce a man to accept a very injurious billet, where he is quite stranded as regards promotion, and then one has to commence to teach him medical statistics of which he is wholly ignorant, while an apothecary is engaged totalling up the diets. This may well be changed. Up to 1873 when regimental hospitals were abolished, Hospital Sergeants existed in England and India, now they are purely an Indian Institution and not recognized in England either in pension rules or in any way.

52. By my system the Subordinate Medical Department would open its ranks to these unhappy men, and become an opening for intelligent men from the ranks to rise to good positions. Many of the old regimental hospital sergeants were thoroughly intelligent respectable men.

To-day we are without any reserve for our Subordinate Medical Department. Great numbers of them are quite half grown boys. They would never do in the hardships of a field, and organized as the Medical service must be in a future campaign these lads would be no use to us but be in the way. We want disciplined men of physique and with physical strength to stand fatigue.

We want such men to work under us in the bearer companies, and the young lads will not do for this toilsome duty.

53. Further it is painful but necessary to draw attention to the defective discipline of our present young lads.

Every Gazette shews how they go to grief. They are dismissed they resign, or are dispensed with in no small numbers yearly. I have little doubt that their misdemeanours are often condoned by medical officers who hate to drive them out into the world friendless and homeless. If they were soldiers they would simply be remanded to the battalions for duty.

But if we want efficiency we must avoid all this. We can secure men well disciplined and men who can keep the soldier in order thoroughly, from the ranks of the army, and why not use them. I know how many good men were in the old Subordinate Department but there is a falling off now a days. I fear that three years of a Calcutta life does injury to the young lad's *morale*, and I cannot see what the gain to the service is from it. We want discipline in our subordinates. Ready obedience, the habits of regularity and order and we can get all these things from the pick of the Regiments. Why not let us try the experiment.

By this scheme we would as Doctors be saved much trouble and be far better able for field service than we now are.

54. We are continually being told we are to be kept untrammelled from non professional work. It is in point of fact quite the reverse.

How many hours must we spend striving to drill into a new hospital sergeant's head the difficult subject of medical statistics while an apothecary with most ample leisure is wholly independent of them, and never takes any trouble in the matter. Again we are responsible for the furniture through the Hospital Sergeant, while the whole of the Subordinate Medical Department are carefully guarded against any responsibility for it.

Again we are engaged in constant correspondence with the Commissariat about the purveyors duties and his short-comings, while none of these things effect our Medical Subordinates. They are carefully guarded, and in the end we, the doctors, are kept occupied hours every week by such questions.

If we are to have aids in our work let these be aids not mere dead weights.

Again it is necessary to point out that we are continually called upon to teach and instruct our young apprentices, to keep them from going astray, and in fact to discipline them.

55. Why waste us thus. We can draw from the ranks of the army well disciplined *men*, not boys, by re-casting the duties in the way proposed, we can become far more professional than we now are, and be, I am sure far more certain of real good work being done in our hospitals.

I take it that the argument that we must find employ for the Eurasian community is a very good idea. But I don't think our army hospitals should be the place to experiment in; where the life and comfort of the English soldier is at stake we need trustworthy help and that help we can get from the soldiers comrades and not from men wholly out of sympathy with the soldier. Had we an Eurasian battalion, and were the young men enlisted and drilled there, then they could find in the Barrack Department or Commissariat Department employment where absolute daily contact with the sick soldier would be quite rare. It would save the young men from many painful scenes which must occur when rude young soldiers from England, full of race prejudices first come in contact with them.

SECTION X.

Native Servants.

56. It is to be hoped that no delay will take place in carrying out the scheme for reorganising the Native Servants of the hospitals. No terms can be too strong to express their present inefficiency. Sir W. Muir the present Director General, has publicly stated, in an official memorandum that they are the worst in any army. Vide Circular Memo. Medical Department British Forces 70 and 71—18 September 1871, since that day no improvement has taken place. I would bear testimony to the good classification of servants made by Her Majesty's Committee, and to the great advantages that would accrue from the abolition of the misleading title of Compounder given under the existing system to an ignorant servant, while the same title is borne in our English hospitals by a trained Non-Commissioned Officer.

SECTION XI.

The Station Staff Surgeons.

57. Having been Station Staff Surgeon in several garrisons in India, I would point out a curious anomaly that exists owing to our working the Medical Department regimentally. No statistical record of illness amongst the garrison staff of the station goes to any Superior Medical Authority. If any officer or Non-Commissioned Officer of the general, divisional, brigade or garrison staff, or of the Commissariat, or Barrack Department gets ill or dies, he is not shown in any Garrison Medical record. The slightest illness of a private soldier in a regiment is carefully tabulated, but even the death of non-commissioned officers or officers in extra regimental appointments is not recorded in any medical return. By unifying the Garrison Medical Staff, the Staff Surgeon now an independent unit, will come under the Principal Medical Officer of the Garrison. Illnesses or deaths amongst the garrison staff would appear in the garrison return, garrison dispensaries would supersede the existing staff dispensaries, and a regiment when marching out of a garrison instead of dragging with them as they now do a great quantity of medicine and bottles liable to injury, would be supplied with compact medicine chests made as for field service which would accompany them; all heavy and cumbersome articles being left in the garrison dispensary attached to the Station Hospital.

One word may be added on the question of amalgamation between the Indian and British Medical Services; so long as the Regimental Hospital System goes on, I think officers of the Army Medical Department would rightly object to allow the young officers of their department to lead a life perfectly free from control, in petty Native Hospitals in the same cantonment with British troops. With the garrison system however it would be perfectly possible. The routine of a native hospital and the due discharge of its trivial duties would not be the sole occupation of an officer. He would also be compelled to bear his share in the duties of the European garrison hospitals, and in this way would escape the danger which might waylay an indolent man if his sole charge consisted of the ordinary sick list of a native corps. In the same way by a proper disposition of officers it would be possible to place all existing medical officers of the Indian service who are in military employ, in stations where they would not at first be senior medical officers, and thus prevent any confusion that might at first arise from medical officers of the local service taking over the charge of the European Hospitals; gradually after a few months, when they had mastered the routine, they could be placed in the positions their *status* demanded. But there seems to me to be no difficulty in unifying the military medical services in India, provided that the duty is handed over to the army Medical Department as part of its *Garrison* routine, and that the native hospitals became simply detached native wards of one garrison hospital.

But there would be cause to complain if junior officers were given regimental charge of native hospitals, and were not part and

parcel of the garrison staff of doctors, and their hospitals and their work thoroughly open to the direction and inspection of the Senior Medical Officers.

In Ceylon I remember that the Army Medical Officers took charge of the native Ceylon Rifles without any difficulty. But the Civil and Military Medical Department should be completely separate so that no man once in civil employ would return to military Duty, and all future entries should be for the Army Medical Department. By making the native Regimental Hospitals part of the garrison Hospital, all native servants, followers and establishment could be sent there for treatment thus abolishing all station staff hospitals. Thus sick Europeans could be admitted into the British Hospitals, and sick natives of every class admitted into the native Hospitals.

By handing over the medical charge of the native troops to the Army Medical Department all entries into the military service would be through the Army Medical Department, and the Civil Medical Service a separate organization would recruit its own officers. To it the natives of India would look for employment, for it would be impossible to admit them to the Army Medical Service. The English soldier is full of prejudices against the native races, and even with the Eurasian Medical Subordinates friction takes place. They are wholly without prestige amongst the private men, and it is one of the main reasons that should urge on the recruiting of the Subordinate Medical Department from the rank and file of European troops. To place a Eurasian warrant officer over European soldiers is a grave error, and particularly in a hospital where contact is hourly necessary, and where excited and drunken men are often brought in.

If the Eurasian element need employment the Barrack Department, and others with less friction with the soldier should be their field.

So many officers of the Army Medical Department have now passed the lower standard, that there would be little difficulty in getting the work of the native hospitals done by them as part of a garrison duty.

But to allow, except for a very short time, two different services to do the same work in a garrison and to draw different pay rates for that work would lead to friction.

No difficulty would exist in treating the native troops hospitals as simply native wards of the garrison hospital and working them as such by the garrison staff. No special medical officer would be detailed for them, and the European officers would be treated, as all officers in a garrison would be under a garrison system, by an officer corresponding to the existing Staff Surgeon. In detached native garrisons, of which there are some thirty in Bengal, a Medical Officer would be needed who would be limited of course to native troops only, men whom such positions would suit would always be forthcoming. But to seclude a

young officer of the Army Medical Department from inspection and direct garrison medical control, by putting him in independent charge of a native hospital under the Regimental system would be objectionable, and indeed should not be needed. It would be perfectly possible to lay down a rule that no officer would be senior Medical Officer of a garrison or force who had not passed the Lower Standard, or taken charge of a Native Corps as part of his work for three months. Clearer and more defined codes for working the native hospitals would perhaps be needed, and the system would be assimilated as far as possible to our English Hospitals. The question of cooking, rationing, and equipment no doubt can be dealt with more clearly than at present without any interference with caste prejudice, and I think nothing but good would come of amalgamation.

The existing dual system of Medical Military Organization in India is quite indefensible and leads to divisions and friction, which weaken the efficiency of the whole Medical Corps.

G. J. H. EVATT, M.D. *Surgeon-Major,*
A. M. D.

FYZABAD, July 1878.

IV.

LECTURE DELIVERED AT THE UNITED SERVICE INSTITUTION, SIMLA, ON THE "RUSSO-TURKISH" WAR OPERATIONS IN EUROPE UP TO SEPTEMBER 1877,

BY CAPTAIN A. D. ANDERSON, R. A., ON 8TH OCTOBER 1878.

Lieut. General Sir A. Taylor, K. C. B., R. E., in the chair.

At the conclusion of the struggle between Turkey and Servia in 1876 an Armistice to end with the month of February 1877 was agreed to, and a Conference of the Great Powers was sitting at Constantinople in the hope of preventing a recurrence of hostilities and averting, if possible, war between Russia and Turkey. These two States were, during the winter months more or less preparing for the contest.

The Russians, by an Imperial Order dated 13th November '76 prescribed the formation of 6 Corps d'Armée numbered 7 to 12, composed of troops stationed in the military Circles of Odessa, Kiev and Kharkoff with the partial mobilization of those in the Moscow, Vilna and Caucasus Circles, to continue by degrees till all the Military Circles of European Russia except Finland were placed on a War Footing. Of the Six Army Corps above mentioned the 8th 9th 11th and 12th were to form the Field army, or army of the Danube, the 7th and 10th the Coast Army.

Each Russian Army Corps is divided into two Infantry Divisions and 1 Cavalry one. An Infantry Division comprises 4 Regiments or 12 Battalions of about 800 men each.

A Brigade of Artillery (3-9 pr. and 3-4 pr. Batteries, each of 8 guns) total 48 guns. And 1 Cossack (irregular) Regiment of Cavalry (of 6 Sotnias.)

Total strength 16,000 men and 48 guns. Each Cavalry Division consists of:—

- 3 Regular Regiments (each of 4 squadrons.)
 - 1 Irregular do. (6 Sotnias).
- Total about 4,076 men and 12 guns.

Thus an army corps represents roughly 36,000 men, 108 guns.

An Infantry Division 16,000 men and 48 guns.

A Cavalry Division 4,000 men and 12 guns.

or, as a rule, something under these numbers.

The irregular Cavalry were mostly Cossacks of the Don, armed with Lance, Sabre and Berdan Carbine, they bore a wild appearance, for though dressed in uniformity they furnish their own clothes, horses and equipment, except Carbines which are provided by Government.

The Russian Cavalry as a body throughout this campaign appear on the slightest provocation to have dismounted and worked virtually as Infantry ; whether this was owing to want of training as mounted men or to the nature of the ground is hard to say—probably also to the fact that the Cossack cavalry do not move at a very rapid pace and accordingly had little chance against an enemy armed with breech-loaders.

Preparatory measures for the mobilizations had been taken ; Reserve men were warned not to leave the localities they were then in ; the number of horses that would be required was made known, (Government having the power to take the horses of the country for the army in time of war against an indemnity from the Crown), and in spite of the inclemency of the weather and the bad state of the roads the assembly of Reserves was completed in 17 days and they were handed over to the Military Authorities.

The Militia or Landsturm Law, was by an order of 6th December '76, brought into force for the three Southern Districts, the men thus embodied to be used for filling up vacancies in the Reserves, and to reinforce or take the place of the troops told off as the Coast army, along the shores of the Black Sea and in the Crimea.

The ordinary traffic, passenger and goods, on all railway lines running southward, was to be stopped after 14th November whenever the number of Military Trains required upon a line exceeded 18 in 24 hours.

Siege Artillery Parks of 400 and 92 guns at St. Petersburg and Chotin respectively, were in process of formation.

4½ Battalions of Pontonniers were mobilized at St. Petersburg.

22 large guns were despatched to Sebastopol and Nikolaieff, and a large quantity of torpedoes to the former place.

In Bessarabia large pontoon trains were being formed and sent towards the banks of the Pruth.

All available steam launches and boats numbering about 26 at Kronstadt and Nikolaieff were prepared for carrying guns.

Large contracts for war material were pushed forward, such as—
300 Field gun carriages.

14 Eleven inch Gun Carriages.

6,000 Tons of Projectiles for 11" and 12" guns.

A large order for Cartridges, and another for powder, both with American Firms.

11-38 Ton guns from Krupp of Essen ; Rifles (the army of the south being all armed with the Berdan) were being turned out at the small arm factories as fast as possible.

Trains from Kiev and intermediate Stations carrying troops, stores, materials &c. were despatched towards the frontier at the rate of 20 carriages every half hour. Military Officers were placed in charge of most of the principal Stations.

The district around Kischenev offered small resources for supporting a large Army, and constant transport of provisions was therefore going on.

Bessarabia possesses one Railway, the Odessa,—Kischenev—Jassy Line, but of roads as we understand them, none; such as they were they had to be placed in serviceable order.

Two Battalions of Sappers and two of Pontonniers at Levo were employed constructing and making up floating bridges on the Pruth.

Several superior Officers of the Russian Army were collecting large stores of provisions at the principal stations on the Jassy—Galatz Line.

Immense stores of supplies, hay, barley, oats &c., and preparations for Artillery for an Army, of 300,000 men were being made in Bessarabia.

16 Companies of Marines were moved down to the Pruth from Kronstadt.

The organization of Hospitals on a very large scale was ordered as follows :—

4 Permanent, viz Kischenev 2, Bender 1, Tiraspol 1.

30 Provisional Military Field Hospitals each of 630 beds ; Total 34 Hospitals providing in all 19,922 beds.

Lieutenant General Skobelev organized a Division of Scouts sometimes called the "Flying Division" It consisted of 3 Regiments of Cossack Cavalry, a six Gun Battery and a regiment of Terek Mountaineers, (these last being volunteers, Christian and Mahomedan and including many of noble birth in their ranks.)

The whole force turned out fully equipped at their own expense, but their flint muskets were exchanged for Breech Loading Carbines, and they received pay and forage while embodied. They were intended to work independently of the different Army Corps, to collect information and keep a good look out both in front and flank of the advance; to harass the enemy, disarrange his plans, and generally annoy him, by unexpected movements and sudden attacks. How far they came up, to the expectations formed of them will be seen as we proceed.

Preparations were made for the reception of large bodies of troops at Galatz, Buzeo and Kalarasch.

The Coast defences of the Black Sea were strengthened.

12 Russian Gun Boats were selected for service on the Danube.

16 small steamers were in readiness for the passage of rivers, and torpedoes were laid down at the mouths of the principal harbours and rivers.

At Kischenev a temporary bridge was constructed and ready to be floated down the river. 13 steam launches and 5 Torpedo boats were held in readiness; also 24 small pontoons in pieces and others of larger sizes.

Contracts were made with merchants and others for delivery of large quantities of provisions during April, at Jassy, Guirgevo and towns in Roumania, between those points.

All Railway companies in South Russia were ordered to add Ambulance Carriages extensively to their Rolling Stock and to be prepared to suspend ordinary goods traffic after 27th January if required—8,000 men, Military Engineers, were employed on the railway in Roumania assimilating the Gauge to that of Russia by putting down an extra line of rail.

Large additions were made to the rolling Stock of the Southern Railways from other lines, the Kiev line alone received 380 Carriages.

All these and many other preparations shew the Russians to have foreseen and prepared for war; they were thus enabled in spite of the Railway organization proving unequal to their task from want of rolling stock, to place on the Roumanian frontier and in support, before the Declaration of War, the following forces.—

Four Army Corps 8th, 9th, 11th and 12th on the line of the Pruth, Head Quarters Kischenev, advanced Guards on the frontier extending from Sculiani to opposite Bolgrad.

Siege Train and ammunition Columns at Bender.

The 7th Corps at Odessa and 10th Corps in the Crimea; in all what should have been 190,000 Infantry 22,000 Cavalry and 648 Guns, but as far as I can make out only 170,000 Infantry crossed the Pruth with their reserves at Moscow and Kiev to replace the Field Army when it moved forward.

These forces may be said to have been very complete with the exception of Transport, of which from all accounts they were short, and in Officers, the deficiency of whom amounted to as many as 300 in one Army Corps, or about $\frac{1}{3}$ rd of the full complement.

War was declared by the Russians on the 24th April 1877.

Let us now turn to the preparations on the other side.

These fell far short of what could or should have been made, and the Turks were I believe, rightly described in February (a month before the Declaration), as being quite unprepared for war and remarkably blind to their own deficiencies.

After this date, efforts were made to reinforce the detachments on the Danube.

Troops from Mostar and other places in Herzegovina and from Serajevo in Bosnia were recalled and the Turkish Army in Albania was broken up.

Most of these detachments were ordered direct to Bulgaria and the Danube by road.

15 Battalions proceeding to Constantinople by Sea.

25 Battalions were withdrawn from Podgoritzza and Scutari on the frontier of Montenegro, to Constantinople and 90 Battalions of Redifs from Anatolia.

150 Battalions of Redifs not yet called out, were ordered to be mobilized, 60,000 men were withdrawn from Syria.

The Mustahfiz or last Militia levy were now for the first time called upon, and at the last moment the Tcherkess or Circassian Cavalry were mobilized to be employed against an anticipated Russian advance in the Dobrudscha.

The Turkish Infantry were armed chiefly with Martini-Henry's, Sniders and Muzzle loaders, the Cavalry with flint pistols and Remington Carbines.

There was at this time a very large portion of the Turkish Field Army, nearly 80,000 men, in and about Widin, and on the frontiers of Servia, these they slightly reduced, moving detachments across Bulgaria to their right.

On the date of the Proclamation of War their available forces may be put down roughly as follows.

Widin garrison, including 5 Battalions distributed between Palanka and Lom to keep up the communications—30,000 men.

Field Force (in an entrenched position in the vicinity of Widin—40,000 men, total 70,000.

40,000 men were at Nissa on the Servian frontier to be ready for termination of armistice.

Rustchuk	29 Battalions.
Turtukai	3 "
Silistria	34 "
Tuldscha	3 "
Isakchi	3 "
Matchin	2 "
Medschidil	2 "
Czernavoda	2 "
Babadagh	2 "

in the Dobrudscha 4,000 Tcherkess :—

Kustendje	1 Battalion.
Varna	21 "
Shumla	41 "
Ternova & Rasgrad	3 "
Sophia	14 "

or in all about 190,000 men.

30 Squadrons Cavalry and 270 guns prepared to oppose the passage of the Danube.

Besides these there were in :—

Herzegovina	49 Battalions	27 Guns.
Bosnia	41 "	6 Squadrons 42 "
Albania	38 "	30 "
Epirus & Thessaly	15 "	7 " 18 "
Crete	14 "	24 "

or about 150,000 Infantry, 13 Squadrons Cavalry and 141 Guns, making a grand total of about 350,000 Infantry, 43 Squadrons and 311 guns, a force which, if it had been but fairly handled should have made a very stout resistance to the Russian 190,000 Infantry 22,000 Cavalry and 648 guns with the reserves coming up in rear.

The paucity of guns on the Turkish side, averaging but little over one per thousand men and I may say the almost total absence of effi-

ent Cavalry, must have proved elements of great weakness when brought into contact with the Russian 648 guns (an average of over 3 per thousand men) and 22,000 Cavalry, had these throughout only been fully made use of.

Roumania and Servia held aloof from demonstrations towards either side.

A project was discussed for establishing a neutral zone in Roumania in the event of war breaking out, but this was found to be impracticable and the Russian forces were finally only debarred from entering the capital Bucharest. This led to a line of Rail being constructed round and outside the place. The Roumanian army was being raised to 60,000 men and in dread of a Turkish movement across the Danube at Widin were being concentrated in Little Wallachia.

The Servian forces nominally consisted of 2 army corps of 32,000 men and 96 guns each, but the whole army was in such confusion that it was doubtful how many of these would be available. Preparations for war were reported as being made by the Servian Government, it all however ended in the Servians taking no part in the campaign.

The Armistice between Turkey and Montenegro expired at midnight on 12th—13th April and was not resumed. Suleiman Pacha and his army met with most determined opposition, and after very severe fighting only partially subdued the province, while their services were for the time lost where they would have been most valuable. They were eventually recalled.

On the declaration of war the Russian Field Army, concentrated on the Pruth, crossed that river at three points viz. Sculiani by rail, at Leovo, and opposite Bolgrad by road. They also seized without delay the Barbosi bridge across the Sereth, a point of great importance,—while 2 fresh army corps the 13th and 14th moved up in support at Jitomir and Kischenev respectively.

The advance to the Danube was conducted on two lines; the Right, or those by rail from Sculiani, to Marazesti, from whence they marched via Fockhani and Rimmik to Buzeo, on the line, and then by rail towards the Danube.

The Left, or those from Leovo and Bolgrad, moved by road via Galatz to Braila on the rail, and thus towards the Danube, portions of these on the extreme left moving by road on Obilisti and Slobodzia opposite Silistria.

The 7th Army Corps extended from Odessa and occupied the Coast from that place to Kilia and Ismail, while the Russian positions all along

the North bank of the river from Braila to Kilia were being fortified and strengthened.

The deficiency in Transport, the bad state of the roads, and the fact of the Roumanian Railway being only a single line, all began to interfere seriously with the Russian advance; and these difficulties were increased by heavy inundations in Roumania: the floods and landslips by damaging the line and bridges, brought, on this route alone, at one time 15 Engines and 200 Carriages to a stand still and reduced the passage of troops over the Barbosi Bridge to 5 Military Trains per day.

Want of Rolling Stock and a break of Gauge, Russian being 5 feet and Roumanian 4'8½", also greatly impeded their operations.

The Telegraph Lines in Roumania were being worked by Russians, and they, knowing the weak point in their line of communications were elaborate in their defence of the portion of it along the banks of the Danube, Cossacks patrolled it day and night, and pickets were stationed at every bridge.

Their position at the mouth of the Danube was made one of very great strength, the villages were secured by earth works, heavy guns were placed at convenient points along the banks, 6 Gun boats were stationed at the mouth of the Sereth for the protection of the Barbosi bridge. Torpedoes were sunk in the bed of the stream and at the mouths of the Pruth and Sereth, while preparations were made higher up these rivers to float down three ready made bridges to any points when required.

The Russian right Column at Bucharest spread on their left to Ursicini, Slobodzia and Gura Jalonitza with advanced posts on the Danube opposite Hirsova and at Kalarasch.

On their right, troops passed by rail to Krajovo and thence down to the Danube opposite Rahovo, while large concentrations were being made between Bucharest and Giurgevo, at Alexandria, and Rusvede Wede, with advanced posts on the river from Oltenitza to Islaz.

Desultory bombardments supported on the Turkish side by Monitors, and raids across the river from both sides, with apparently no definite object now commenced, and continued till about the end of May when the Russians crossing from Braila managed to establish themselves in Khiasett a small fishing village on the right bank of the Danube, and a kind of outpost to Matchin. They immediately proceeded to entrench themselves and erect batteries, but were for some weeks unable to advance further owing to the swamps and the generally flooded state of the Dobrudscha.

The construction of a floating bridge was immediately commenced, the river bed having been laid with torpedoes above and below; this

was completed by the 25th June, when uninterrupted passage of troops was carried on.

With the apathy which appears to have characterized the Turkish management of affairs throughout, this small force was allowed to hold its position for three weeks virtually unmolested, though the Turks could have collected in the Dobrudscha and launched on them at least 20,000 men.

One would have imagined that considering the strategical importance of this post to the Russians, no efforts would have been spared by the Turks to dislodge them. Nothing was done and the value of this lodgement will be seen as we proceed.

The bombardment of Kalafat, Braila and other Roumanian towns by the Turks, the chief feature of which was that their shells seldom exploded, conclusively decided the action of that State, and the Roumanian army proceeded to take its position on the right of the Russians occupying the banks of the river from opposite Rahovo to Kalafat.

The Circassian (Mahommedan) element in the Russian Army chiefly in Skobeleff's Flying Division does not appear to have been found a success, for they were sent back to Russia on account of insubordination as fast as possible, to be located in Siberia. This almost completely broke up the Flying Division.

The Russians may be said by the end of May to have got their forces into position preparatory to crossing the Danube, their tactics being apparently to make all possible display of force from Islaz along the bank of the river to Kalafat ; to keep back and out of sight their large concentrations at Alexandria and Banjassa ; to connect these on their left with the force at Braila by troops in echelon at Ursicini and Slobodzia and to hold the left bank of the river, from Braila to the Sea, the weakest part of their line of communication as strongly as possible.

The strength in their first line remained much as before stated. The only change being the movement of the Head Quarters of the 7th Corps from Odessa to Galatz, the advance of the 4th, 13th, 14th, Corps to the Pruth and of the 15th Corps to Odessa. These four last named being in Reserve and forming the 2nd Line of the active army. The Head Quarters of the army were moved successively to Ploesti and Bucharest. Appearances pointed to the passage of the river being attempted at Islaz and Isaktchi and probably at several intermediate points as feints ; General Chesney reported Isaktchi and Tuldscha as being the two most suitable points on the whole river for crossing, the breadth at these places being only between 200 and 400 yards.

We will now follow the Turks from the Declaration of War to the present time.

Foreign Legions were being raised in Constantinople, one of Poles one of Hungarians and were filling fast.

Circassians were being enrolled in great numbers for service in Turkey.

It was resolved to admit Christians to the army.

Small bodies of troops were moved from Beyrout, Acre, and other places in Asia Minor. All the Gendarmerie in the Adrianople vilayet were ordered to the front, their places to be supplied by the "Mustahfiz" who were being mobilized.

Lines of Defence round Constantinople were commenced between Derkos and Bojuk Tcheckmedge, the inhabitants of the city being called upon to supply forced labor.

The only Fortresses worthy of the name south of the Danube were Rustchuk, Silistria, Shumla and Varna. These, though their fortifications were obsolete and in ruins and the few guns mounted in them were valueless against an attack under modern conditions, were being transformed into formidable positions by the construction of important field works in their vicinity, this was especially the case with Rustchuk, Shumla and Varna, and, as will afterwards be seen, with Plevna.

Guns, heavy and light, were being placed in position on and around these fortresses as fast as procurable.

These and many other precautions in the way of reinforcing and supplying the army in the field were made by the Turks, but in the way of dispositions of troops, or preparations to meet possible passages of the Danube by the Russian forces, one might say they made none.

When appearances pointed to a probable passage in the vicinity of Rahovo, they moved 10,000 men from Widin eastward, but through some misguided idea continued to keep close on 120,000 men on their extreme left distributed between Widin, Nissa and Sophia.

Political reasons have always been assigned for this unintelligible division of their forces viz. over 100,000 men on the frontiers of Servia and an equal number distributed as I before mentioned between Herzegovina, Bosnia, Albania, Epirus, Thessaly and Crete ; but it is hard to discover what line of policy could have been to them of greater importance, than safely guarding the direct line of Russian advance on their capital.

These frontier Vassal States could, I feel confident, have with advantage been left to themselves by the Turks, and the whole strength of the nation devoted to repelling the Russians, the struggle with whom was one for political existence, and on which all depended.

The progress of the War compelled them later on to withdraw all, or nearly all of their scattered forces, which could well have been done at the commencement of the campaign. If the apathetic arrangements of the Turks on land astonish one, how much more have we cause for wonder at their neglect to utilise their fleet, and through them convert the Danube into their first and one of their strongest lines of defence.

The naval force of Turkey at this time appears to have been :

“The Fleet” composed of 116 Ships, carrying 759 Guns and manned by 16,000 men.

“The Danube Flotilla” composed of :

7 large ironclad Gun boats each carrying two Armstrong guns and a bronze gun of small Calibre.

4 wooden Schooners (screw steamers) carrying one heavy gun on deck and four small in broadside.

2 Iron Gun Boats each with a Gun in the bows.

6 Transports carrying each two Guns.

1 Despatch vessel of four Guns.

4 Ironclad corvettes.

In all 23 Vessels.

Opposed to which the Russians had 2 Ironclads, one at Nikolaev one at Sebastopol, besides the gun boats and Torpedo boats being prepared as I before mentioned on the Pruth and Sereth, to be floated down to the Danube, and the gun boats they afterwards deposited by rail at Galatz and Slatina.

I do not believe I overstate the facts when I say that out of this immense preponderance of naval power, the Turks gained no advantages, their energies were frittered away in useless bombardments, while on the other hand the Russians had the good fortune to blow up the Turkish Corvette “Seifi” with her whole crew by means of a shot from the shore, also to utterly destroy the Turkish Monitor “Hifzil Rahman” 4 Guns and 219 Men by striking her with a Torpedo ; while by the end of June with the aid of their Torpedo and Gun boats and Torpedoes judiciously laid, they held command of those portions of the river required by them, and were free to do what they liked, regardless of the Turkish Navy or Flotilla.

On the night of the 21st June the Russians completed, without molestation, the bridge from Braila to Khiasett the materials for which were prepared on the rivers Pruth and Sereth and towed into position as required.

On the 23rd the Head Quarters of the 14th Corps were established at Matchin, the garrison of which place made a short resistance but

Isakchi and Tuldscha were evacuated almost voluntarily, the Turks retreating viâ Hirsova on Czernavoda, and by Babadagh on Kustentsche.

Pontoons made at Galatz were sent by rail with steam launches and torpedo boats to Slatina and floated down the Alouta, some were also sent to Fratesti and thence by road on trucks to the Danube. Timber was purchased in the Carpathian forests, all the available carpenters and woodmen of the Transylvanian town of Hermannstadt were liberally paid, and superintended by Russian Engineers to construct rafts, bridges &c., which were floated down the Alouta to the Danube.

Under the protection of their steam launches and Torpedo boats they laid Torpedoes across the river opposite Parapan and above Nicopolis, to protect their proposed bridging operations from possible attacks by Turkish ships.

A display of force was made at Nicopolis with a feint of crossing at Turnu Margurele; and to lead to the belief that this was the real attack, the Russian Emperor was led to shew himself on the banks of the river. This induced the Turks to withdraw their troops from the point actually selected for the crossing, viz Simnuitza, opposite and about a mile below Sistova, where they left only 1 Battalion and 1 gun and about three miles lower down the river, 5 Battalions and 5 guns. During the night of the 26th June, pontoons were collected, and at 2 a. m. on 27th the crossing was commenced, the fire of the Turkish outposts brought their small forces in the vicinity, about 6 Battalions and 6 guns, to the spot, but these though they resisted stubbornly were by degrees overpowered and by two o'clock in the afternoon were falling back towards Nicopolis and on Ternova. The Russians establishing themselves on the heights they had won near Sistova, continued crossing their troops in boats, pontoons, &c., without interruption, and floating down materials from the Alouta, had completed a bridge across the river by the 2nd July. Here we have another instance of flagrant neglect to seize an opportunity on the part of the Turks.

The Russian troops on the right bank of the river were from the 27th June to 2nd July in a most critical position.

By 2 p. m. on the 27th twelve hours after their movement was known by the Turks, they had barely got 16,000 men across the river, and by nightfall little over 20,000, with a very small proportion of Cavalry and Artillery.

The Turks had in Rustchuk, about 30 miles off, 20,000 men. In the vicinity of Sistova, 6,000 men, at Nikopolis, 28 miles distant, 5,000 men and in camp at Bjela, about 20 miles away 4,000 more, in all 35,000 men who could have been on the spot within 24 hours.

These could certainly have all been available by the morning of the 28th and had this been done and the crossing resisted with energy,

it would have been to the Russians a very much more difficult matter, if it had not led to their being forced to recross the river.

No assistance was given to the handful of troops immediately in the Russian front and they were compelled to fall back.

When the bridge at Simnitsa was completed, the crossing continued uninterruptedly and unmolested, and by the 5th July the screen of Cavalry to cover the advance, moved forward followed, by the main body on the 7th, along the Ternova road.

One Corps diverged to the right towards Nicopolis, another (the army of Rustchuk) to the left towards that place.

The advance of the centre column covered by the 8th and 13th Cavalry Divisions was continued up the left bank of the Jantra and across the Ruschitza; the Turks falling back without attempting to oppose them, to such an extent that General Gourko with only 7 Squadrons of Cavalry captured Ternova, which is a strategically important town in a strong position, at that time occupied by 3,000 men besides 3 Turkish Battalions despatched to their assistance from Shumla who had arrived within 3 miles of the place. These all retreated in haste in the direction of Shumla. In thus neglecting to fortify and secure Ternova, the Turks lost the key to some of the most important passes of the Balkans. Its position completely blocks the route by Gabrova, Schipka and Kesaulik and another route that runs east through Stararecka towards the pass from Rustchuk by Osmanbazar—Kasan and Sliwno.

In like manner the left column occupied Bjela almost unopposed, dragoons acting as Infantry Skirmishers and scaling the heights with bayonets.

The Infantry moved by a road along the bank of the Danube. direct on Rustchuk.

The Turks in position on the line of the Lom retreated on Rustchuk and Shumla and the Russians with their left occupying Pyrgos commenced the construction of a bridge across the river at that place, and proceeded to wheel the Army of Rustchuk, now composed of 40,000 men, up to the left, partially investing the place.

The right column 9th Corps moving on Nicopolis found itself opposed by 7,000 men and one Battery of Artillery, besides the guns of the fortress. The attack on this town aided by a bombardment from the other side of the river, for some days previous, commenced on 15th July; the place surrendered on the 16th and with the garrison, 40 field guns 12 of large calibre and 2 crippled monitors which were lying hidden in a creek, were captured. This was an important success, as it not only dislodged the Turks from a threatening position in rear of the Russian advance, but it put the Russians in possession of a bridge head in the event of their requiring it.

The Russian right now turned in the direction of Plewna.

The advance southward on Plewna appears to have been done without proper use of cavalry, the result being that they were unaware of the approach of Osman Pasha with large reinforcements from Widin, coming in contact with whom in and near Plewna on the 19th July, they were beaten back, and renewing the attack next day were again defeated with heavy loss in men and material.

The Turks had on this occasion at least 20,000 Infantry and a strong force of artillery in addition to the guns in the fortress on the formidable entrenchments lately thrown up round the place, to oppose against a Russian Army Corps which owing to mismanagement was only partially brought into action, any great resistance being unexpected.

This was the first check sustained by the Russians, it created a revulsion in the public opinion of Europe as to the value of Russia as a Military Power and seriously affected the Russian movements in other parts of the theatre of war. Had the Turks, after this victory, possessed the power of following it up, the results might have been valuable, but as will be seen in many other cases, they appear to have been utterly unable to advance or take advantage of any successes that fell to their lot.

In the Dobrudscha 25,000 Russians had crossed by the 29th June, their advance southward was totally unopposed, and by the 16th July Czernavoda, Kustentsche and the railway, were in their hands, their advanced posts occupying Mangalia and being close up to Silistria.

I will now for a short time leave the movements of the opposing forces and endeavour to discuss the strategical features of the situation.

The Russians, debarred from the Sea were confined to the left bank of the Danube and a passage of it where feasible. They clearly realised that the weakest point in their line of advance was that between Kilia and Braila and strengthened it accordingly, but that they were right in choosing as their main line the Sistova—Ternova—Schipka route, I fail to see.

A study of the map can, I believe, lead but to the conclusion that an advance from the Russian left through the Dobrudscha, cutting the Kustentsche—Czernavoda line, the Rustchuk—Varna line and road, and direct over the passes on Constantinople with a view to turning the Turkish right and if successful causing their whole line to fall back, or driving them westward off their line of communications, would have been the soundest plan.

Results too, go far to prove that this last might have been simple and more successful, than the route they adopted.

After establishing themselves at Khiasett they cleared the Dobrudscha without opposition and could have secured to themselves as

many crossings between Galatz and Kalarasch as they chose. They were at the time in a position to move the 4th, 7th, 13th, and 14th army corps into the Dobrudscha with the 8th and 15th at no great interval in their rear. They would in their advance on the Balkans have found themselves opposed by at the most 80,000 men including garrisons, supposing the country to have been swept as far as Ternova, with these they could have dealt, before the large forces from Western Bulgaria could have arrived on the scene. Russian success would have forced the Turks off their line of communication with, or to fall back along their whole line on, Constantinople ; while in case of defeat the Russians had but to retire along their line of advance

The barrenness and unhealthiness of the Dobrudscha are quoted in addition to the fact of the Russians having lost command of the sea, as reasons for their abandoning what appears to have been their proper line of advance and that which was selected by them in 1828-29.

Results I believe disproved the first, for Zimmerman's army of some 40,000 men remained throughout the greatest portion of the Campaign in the Dobrudscha without suffering from disease or sickness more than the troops in other localities. As regards the 2nd reason, that the Turks now held command of the Black Sea, it appears to me that had they displayed more than their usual activity and landed troops between Varna and the mouths of the Danube, on the flank and in rear of the Russian line of advance, a smaller force would have sufficed to successfully oppose any attempts of that description, than the Russians on the present occasion found it necessary to detach for the occupation of the Dobrudscha, and the two field armies they were compelled to post on the right and left flanks of their actual advance through Bulgaria.

No less an authority than Baron Von Moltke writing on this subject, after explaining how the Russians in that campaign, advancing by their left found the chief obstacle to their advance Varna ; that in order to lay siege to that place it was necessary to post a body of troops before Shumla strong enough to hold the Turkish army assembled there in check, says, " We may assume it was within the bounds of possibility" " and the scope of the Russian plan, to cross the Balkans should" " Varna fall in time, and to march on Constantinople should they" " succeed in forcing the Turks out of their entrenchments at Shumla" " and in beating them"—and concludes with :—" This plan of operations" " is so unavoidably marked out by the nature of the country and the" " circumstances of the case, that it must be applicable in its general" " outlines not only to the Campaign of 1828 but to every future" " Russian Campaign in Rumelia."

The actual Russian advance through Bulgaria compelled them, as I before mentioned, to keep a large force in the Dobrudscha to guard their drawn out line of communications, and a field army on each flank of their main advance southwards, while in advancing via Sistova—Ternova—Schipka they drove the Turks direct back on their base, and

laid themselves open to attack from the Turkish field army in the Quadrilateral on their left and on their right from the large forces which the Turks had time to move down from Widin, Nissa and Sophia.

Looking at the Turkish side from the same line of reasoning, one fails to see, as I said before, what political reasons could have been sufficient to necessitate their keeping $\frac{1}{3}$ rd of their army in frontier states, and $\frac{1}{3}$ rd on their extreme left, at such a crisis, and which troops they afterwards found it possible to recall. Had they withdrawn the whole of their forces from Western Bulgaria and the provinces, and held the Dobrudscha in force, determined to maintain and support their right at all costs, dispersed their detachments at convenient intervals and in suitable numbers say 5 to 15,000 men along the Danube from Rassowa to Nicopolis which could have been done at about 1,000 men to the mile, with the larger portions opposite possible crossings of the river, there being points such as the vicinity of Czernavoda and between Turtukai and Rustchuk where the breadth of the stream and the swampy nature of the banks debarred bridging operations; and connected these detachments by telegraphic communication, they should have been able to concentrate on any point within 24 hours over 30,000 men; a far larger force than the Russians could have got across the river in that time. A lodgement in, and an advance through the Dobrudscha would under these circumstances have been for the Russians a far more difficult matter, while strength on their right would have placed the Turks in a position to operate from Kiasett, Matchin or Isakchi across the river upon the Railway from Galatz to Braila and its bridge across the Sereth at Barbosi, damage to which would most seriously have hampered the Russian advance.

The Turks in this position would have held command of the 6 available passes over the Balkans, viz. The two flank and most feasible ones, from Varna to Burgas, and the Schipka from Ternova to Kesaulik—the Chenga Pass from Pravadi to Aidos—the Bohas Pass from Shumla to Karnabad—the Bogaz Pass from Kasan to Karnabad—the Demir Kapu Pass from Ternova to Sliwno—besides the smaller intermediate ones. These, added to the Railways and the facilities of transport by sea to and from Constantinople need have caused them no fear for their communications.

Had the absence of troops in Western Bulgaria induced the Russians to advance in that direction, every mile to the west only lengthened their already over-drawn communications and rendered them more liable to attack or interruption.

No Russian advance on Constantinople could have been attempted leaving the forces of the enemy north of the Balkans on their flank and rear, while supposing the crossing to have been successfully effected to the west, in front of the Turkish left, they, by throwing back their

centre on Rasgrad and Shumla and left on Ternova which covers the Schipka Pass and which being naturally strong could have been with advantage occupied in force; would have been enabled to shew a new and formidable front, supported by the fortresses of the Quadrilateral, to the Russian advance.

That the Turks in confining themselves to a defensive war behind the Danube, and refraining from opposing the masses of the enemy in Walachia, were acting rightly, I believe there is no doubt; but that they neglected to take advantage to the full of the river as there first line of defence is I believe equally clear to understand.

General Chesney discussing this point from the experiences of the 1828-29 Campaign, urges that the Turks taking advantage of the northerly bend of the river towards its mouth, might have crossed a force almost at the banks of the Pruth on the flank of any Russian advance, and that with due caution, daring and possibly successful operations might have been carried out, while the worst that could happen to them would probably have been the necessity of retiring to the right bank.

Nothing of this sort was, however, attempted, the passages of the river were almost unopposed, and no effort of any magnitude was made to check the Russian advances southwards till they had succeeded in moving large portions of their Army into Bulgaria.

Between the 10th and 20th July the army of Rustchuk and that on the Lom were comparatively idle, not so the centre column at Ternova.

On the 12th July the advance Southward was continued, General Gourko with a mixed force of Cavalry, Artillery and Infantry between 5 and 6,000 men pushed forward as advanced Guard, by an almost unknown route called the Khankioi Defile between the Gabrova and Elena Passes heading towards Kesanlik with the view of turning the Schipka Pass where the Turks were strongly posted. He detached to his left a reconnoitring party along the Osman Bazar road to ascertain if a Turkish concentration at that place existed and whether the Turkish line extended South of the Balkans. In this movement he suffered some loss but discovered that about 6,000 Turks were posted at Osman Bazar and that they being the extreme left of the Turkish line, it was not prolonged south of the mountains. On the 14th debouching from the hills in three columns he occupied the village of Khankioi; on the 16th moved up the Tundscha valley and the following day 17th July occupied Kezanlik and the village of Schipka which closes the Southern side of the pass.

The resistance offered to his advance though continued, especially in the direction of Esektscha never exceeded that of a few hundred men at a time, while the Turks under Suleiman Pasha marching up with

supports from Adrianople were within a few miles and appear to have been totally ignorant of the movements of this force.

An attack from the North by about 4,000 men and 6 Guns of the Russian Main Column was delivered on the Schipka Pass on the 17th July, but failed. In this General Gourko was to have assisted with his force from the South, but having been delayed a day on his march, attacked from his side on the 18th with a like result. A combined attack, however, on the 19th June from North and South was arranged, when they met with no resistance, as the Turks had abandoned the Pass, camp, guns and standards, retreating in a westerly direction, and placed this valuable position and road in the hands of the Russians.

General Gourko's exploit has led to much comment and sometimes of a severe nature, to which the check at Plevna gave a certain emphasis, but I cannot believe the blame is attributable to him. The advance to, and across the Balkans, before the flanks of that movement had been thoroughly secured, surely lay with the Commander-in-Chief or those guiding the operations in Bulgaria. General Gourko as Commander of the advanced Guard of the the centre column taking advantage of the want of vigilance on the part of his enemy performed the work allotted to him with boldness and decision, marched 60 miles over the Balkans amid much hardship in five days and aided materially towards the easy and almost bloodless capture of, perhaps, the most valuable pass on that range of mountains.

His handling of the cavalry force at his disposal is a brilliant exception to the general rule throughout the campaign, where this branch of the service, even when strongly represented, appears to have been totally neglected or sadly mismanaged.

The Russian forces may at this period be said to have been; in the Dobrudscha 25,000, advancing on the Lom and round Rustchuk 70,000, in the Balkans 30,000, in front of Plewna 24,000, and 24,000 still to cross the Danube.

Head Quarters had been moved to Sistova and were now at Zarewitsa.

The Russian Army were at this time pinched for supplies and provisions, being dependent on the single line of railway and the one bridge over the Danube, both of which were being constantly damaged; this carelessness in improving or increasing their communications with and through Roumania is not easy to account for.

The Turks had now drawn in their scattered forces and were much as follows. In the triangle formed by Rustchuk, Turtukai and Shumla 100,000 men. Between Silistria, Medschidil, and Varna 50,000 at Plewna and moving there from Widin, Nissa and Sophia 70,000. At Adrianople and advancing from there under Suleiman Pasha 38,000

men, these were chiefly troops from Montenegro who had come via Salonica.

The reverse at Plewna coinciding in time with the capture of the Schipka Pass, stopped any advance of the main body of the Russian centre from that place south of the Balkans.

Reinforcements were drawn from them for the right and also hurried across from the army on the Lom.

The Russians, however, proceeded to strengthen their position in the Schipka Pass, and General Gourko with the true instincts of a cavalry commander, performed at this time perhaps the most dashing feat of the campaign. Leaving his Infantry and Artillery at Kezanlik and himself accompanying his cavalry force, originally 8 Regiments, he started on the morning of the 23rd July via Eski Saara towards the railway from Jamboli to Hermanly and Adrianople, a distance of at least 35, and nearer 40 miles. Having succeeded in breaking up nearly a mile of the line and destroying several bridges, he was back in Kezanlik during the night of 24th July. This successful raid was executed in the face of the army of Suleiman Pacha, who with 30,000 men was at Karabunar between Eski Saara and Jeni Saghra on the 29th July and at the time was advancing on that place.

During the 48 hours this small force of Cavalry must have ridden over 70 miles. Intoxicated with success and perhaps tempted by experience to under-rate his opponents, General Gourko having been re-inforced to about 15,000 men, with imperfect information of the enemy's whereabouts, directed his right via Eski Saara, his centre from Kezanlik and left from Khankioi to move on Jeni Saghra with the view of seizing the Railway station and line; this the centre and left columns succeeded in doing, and only then became aware of the presence of a Turkish force of 30,000 on the Eski Saara—Jeni Saghra road.

At this juncture General Gourko who was with his centre column, having received a message by a round about route from his right to say they were overpowered, driven back to Eski Saara and were in a critical position, promptly attacked the Turks at Karabunar, but being much outnumbered and having been ordered to further detach a portion of his force to support the army before Plewna, in addition to finding massive Turkish columns threatening his left flank and rear, he commenced his retreat, which was conducted in an orderly manner, though with great loss, suffering, and hardship via the Dalboka defile to the Khankioi Pass. The right column succeeded in retiring by a defile north of Eski Saara to the Schipka Pass. The Russian loss in this encounter was about 4,00 men and 4 guns, and had the Turks been able to follow up their success or possessed any efficient Cavalry to make use of, it would have fared far worse with General Gourko and his force. This check combined with the 2nd defeat before Plewna, which occurred about the same

time effectually stopped all Russian advances south of the Balkans for the present.

During the first week in August the positions of the belligerents roughly represented two triangles, the Turks forming the outer composed of three armies, the Widin, Danube, and Balkan respectively, occupying the lines Plewna—Lovatz : Rustchuk—Rasgrad—Osman Bazar ; and a line running along the southern mouths of the Balkan Passes. The Russian lines exactly faced these on the inner triangle.

After the first battle of Plewna the Russians fell back for re-inforcements while the Turks poured more men into the place, till they mustered over 50,000 and greatly strengthened their entrenchments. The Russian Commander, Baron Krudener, though strongly opposed to another endeavour to carry Plewna by direct assault, received imperative orders from the Commander-in-Chief to attempt it again, and accordingly made his arrangements for the 30th July, having been re-inforced to 32,000 men. He, personally, led the right, General Schahkoffskoi the centre, and General Skobeleff the left. The action commenced at day-break with an artillery battle lasting till 2 P.M., when the attack was ordered. The right and centre both succeeded in carrying the first line of entrenchments, but ammunition running short, failed to carry the second ridge, were beaten back and the retreat by night-fall became general. The left seized and held throughout the day an eminence to the South of Plewna commanding the Lovatz road, they however suffered severely and darkness put an end to the fighting.

When the order to retreat was given at night, the Russian troops were completely exhausted, the reserves were all used up, the losses had been enormous, and as before, the Turks failed to benefit by their success ; had they been able to follow up their advantage, they would most probably have inflicted a serious blow on the Russians, demoralised as they must have been by this their second defeat.

The left flank of the Russian army numbering about 60,000 men very much spread out, held the line of the Lom and Kara Lom, their most advanced post being Kadikoi. The withdrawal of troops from this force towards Plewna after the first defeat, postponed the siege of Rustchuk, and the second defeat put an end to all thought of it for the present. This force on the Lom was opposed to the field force of about 50,000 Infantry 5,000 Cavalry and 150 guns under Mehemet Ali, exclusive of garrisons ; or including them 92,000 men and 228 guns. The Turkish position in front of Rasgrad is represented as a horse-shoe, the flanks being thrown forward.

Desultory skirmishes with but small results took place throughout August, towards the end of which large reinforcements were arriving for the Turkish army, and amongst these an Egyptian contingent of 5,000 men under Prince Hassan of Egypt. On the 30th July, the

Turks under Mehemet Ali for the first time during the campaign ventured on the offensive, and did so, successfully.

The left and centre advancing against the Russian positions at Karahasankioi, after heavy fighting which lasted all day and during which the village changed hands several times, succeeded in driving the Russians right across the upper Lom and into full retreat along the roads leading to Karagatch and Kopace.

Mehemet Ali being now desirous of dislodging the Russians from the right bank of the lower Lom attacked their entrenchments around the village of Kadikioi on the 31st, and succeeded in driving them back as far as Kazeljevo on the banks of the river. Again some mysterious cause seems to have prevented the Turks from following up the successes of these last two days. Mehemet Ali found it necessary to organize his forces afresh about Karahasankioi, a lull in the fighting ensued and a delay of three days occurred, this too at a critical moment. The attack on the entrenched positions of the Russians around Kazeljevo, to which they had fallen back was only executed on the 5th August, but resulted in another success for the Turks; the Russians retreating across the river. This retrograde movement was now continuous along their whole line with a view to occupying fresh and prepared positions on the left bank of the Jantra.

A lull in the fighting again occurred, lasting through the first 10 days of August.

Though up to this point endless opportunities had been neglected in every part of the theatre of war by the Turks, one could have forgiven them all, had they but taken advantage of the chance now afforded them. The 2nd Russian defeat before Plevna on 30th July; General Gourko's retreat over the Balkans on 31st July and 1st August, and the 1st defeat of the Czarewitch's army by Mehemet Ali on 30th and 31st July followed up by his second victory over them on 5th August placed the Russians in such a perilous position, that had the Turkish armies been directed with one object, common to all, under the guidance of a Commander-in-Chief whose directions would have been obeyed, and a general advance from all three sides of the triangle been ordered at this juncture, the results for the Russians must have been most serious, probably leading to their retreat across the Danube.

But no—Jealousy, Rivalry, Disobedience with, in some cases Incompetence, added to their being apparently no guiding or directing power, led, on the Turkish side to delays and mismanagement which lost to them a golden opportunity they never again obtained.

This may be said to have been the turning point of the campaign, the Russians seeing the mistake they had committed, drew in and concentrated their forces while reinforcing them, and though the Turks in

Plewna continued to make a heroic defence, their cause generally, never again had a chance.

Moltke's words on the 28-29 campaign come again strangely applicable—he says :

“ The whole strategy of the Turks had hitherto consisted in”
 “ passive resistance; by this system and favored by natural advantages”
 “ of the ground, they had succeeded in driving their foe to the brink”
 “ of destruction. It required only one last effort to hurl him over, but”
 “ they were incapable of it.”

How true on this occasion, with the exception of Mehemet Ali's short advance, they were entirely on the defensive ; at this juncture they required but one last effort and were incapable of it.

The proceedings in the Dobrudscha were of so unimportant a nature as almost to require no description. The Russian force of 50,000 men contenting themselves with strengthening a series of positions from Czernavoda to Kustentsche and the harbour of the latter place, which operations the Turks watched without molesting them, though they could have shewn a front of 30,000 men or more in that quarter.

One can understand the Russian policy ; they apparently deemed it safer to gain and secure, safe footing in the Dobrudscha, than to risk anything by pushing forward, having committed themselves to another line of advance. Defeat in this quarter would have been most disastrous, in that their line of communications would have been at the mercy of the victors, on the other hand the inactivity of the Turkish forces on their right is, as I said before, unintelligible. Returning now to the proceedings in the Southern theatre of war we find in the beginning of August the Russians fallen back, holding the passes of the Balkans, and Suleiman Pasha advancing on them.

Suleiman Pasha's object was to lend a hand to Osman Pasha on his left, or to Mehemet Ali on his right.

This he very much hindered.

1st, by his tardy movements; taking 20 days to move from Karabunar to the Balkans, a distance of 30 miles.

2nd, by persistent attempts to re-capture the Schipka pass.

From the 21st to 27th of August, he almost without interruption hurled his forces on the Russian positions in the pass, each day like the preceding ending in failure and resulting in a total loss to him of about 15,000 men. All this might have been spared had he but detached a force from his large army to watch the small Russian detachment at Schipka and pushed on to the front where his presence would have been invaluable.

The Russian reserves were now being drawn upon to their fullest extent, re-inforcements amounting to 80,000 men and the bulk of the Imperial Guard, were ordered to Bulgaria. Their Government changed their policy and brought pressure on the Roumanians to allow their forces to take an active part on the South of the Danube, this they agreed to and their army crossing the river took its place on the Russian right.

On the 2nd August, General Skobelev reconnoitring towards Lovatz found the place garrisoned by 13,000 men; no movement appears to have been made by this force to aid the garrison of Plewna when attacked the 2nd time by the Russians, which considering the distance, 20 miles, seems unpardonable. On the 3rd August a force of 22,000 Russians under Prince Meretinsky and General Skobelev attacked and captured the place (Lovatz) after a stubborn resistance. This was a valuable victory, as it cut off the communications of Plewna with the South, and freed the Russian Army round that place from fear of attack on their left.

On the 12th September, Suleiman Pasha's Army was reinforced up to over 50,000 men, and he received orders to abandon his attempts on Schipka, leave sufficient force to invest the position and block up the Southern exit of the Pass, detach at once 5 Battalions to reinforce Osman Pasha, and move with all his remaining available forces to the Plewna side of the theatre of war.

Sound instructions, had he but complied; his reply being a renewal of his desperate attempt to storm the Pass which resulted in heavy loss and total failure.

On the 21st he was appointed to supersede Mehemet Ali in the command of the Army of the Danube, when one would almost have thought degradation for disobedience of orders too lenient a punishment; and Raecouf Pasha relieved him.

On the 6th September the bulk of the Roumanian Army had taken its place on the Russian right before Plewna; the combined forces being composed as follows.

Russian 52,000 Infantry 6,000 Cavalry. Roumanian 28,000 Infantry and 4,000 Cavalry in all a force of about 100,000 men with 250 field and 20-15 Centimetre Guns. The most striking quality in the Army of Roumania appears to have been the excellence of its Field Artillery, Krupp Guns and well served.

On the morning of 7th September, this force, Roumanians on the right, Russians centre and left proceeded to make the third attack on Plewna and its devoted garrison. During the 7th, 8th, 9th and 10th, a vigorous bombardment was sustained, followed on the 11th by the general attack of the whole line of Infantry; a severe and protracted struggle ensued along the entire length of front only ended by darkness,

the Russians holding several positions they had seized close to the Turkish works.

On the morning of the 12th the Turks assuming the offensive after sanguinary fighting which lasted throughout the day, succeeded by evening in driving back their assailants from every point they had gained.

Thus may be said to have ended in failure the 3rd and greatest Russian effort to carry Osman Pasha's strong entrenched position.

It now began to dawn upon the minds of the Russian Staff that Plewna was impregnable, except to a regular investment and siege.

The cost in killed and wounded of acquiring this knowledge was estimated at upwards of 20,000 men, and the general result of it, that they decided on waiting for reinforcements from Russia and more engineering tools &c., to enable them to reduce the place by a regular siege.

About the 19th September, the Russian Cavalry had completed the investment of Plewna and news having been received that Cheffket Pasha with a force of 20,000 men at Orchanie, was preparing for some movement, the Russian forces on the Sophia road were strengthened by a Division of the Army.

On the 21st a detachment of 10,000 men and 12 guns from Cheffket Pasha's force moving from Orchanie with a convoy of provisions arrived on the morning of the 22nd within 2 hours' march of Plewna, here a Russian Division barred the way and an engagement ensued, in which, aided by a sortie from the Garrison, the Turks forced the Russians to retreat, and on the morning of the 23rd September the convoy of 2,000 Wagons with its Escort, got into Plewna.

This important Turkish success is attributed to the defective working of the Russian Cavalry stationed at Etropol, in allowing the convoy to elude them and to advance thus far, close up to Plewna without being discovered.

We left the Russian left in full retreat across the Jantra towards a position running north and south and about 16 miles to the east of Bjela, in this retreat their left gave up their hold of Pyrgos and all hope of being able to construct a bridge at that place. Again occurred another of the unaccountable delays which so hampered Mehemet Ali, generally attributed to jealousy and disobedience on the part of the Generals under him,—also to the insubordination of the Egyptian troops. These last were loaded with baggage, chiefly owing to the luxury of their officers, and the Staff (mostly Englishmen) are described, as contenting themselves with stopping in Camp, criticizing the Turkish conduct of the campaign and abusing their administrative organization.

Whatever, the cause the Czarewitch was enabled to concentrate his over extended line, to bring up reinforcements raising his total force to

about 80,000 men, and to entrench his new position between the Lom and the Jantra, the result being that on the 21st September, though the Turks with about 50,000 men and 150 guns attacked with vigour and obtained some temporary advantages, the Russians at night maintained their ground, the Turks falling back to their original position.

After this affair the Turkish advance was checked and there ensued another lull ; the Russian outposts extended in a half circle from Metchka on the Danube to Ternova, they had escaped the danger which threatened them, for defeat on the 21st would probably have meant the further advance of Mehemet Ali, which the Russians in their present positions could not well have afforded.

The next news was, that the Turkish forces for some unaccountable reason were retreating, on the 24th, behind the Kara Lom leaving on the ground their field telegraph, ammunition &c.

The intrigues of which Mehemet Ali had for some time been the victim now began to bear fruit, first in rumours that he had a secret understanding with the Russians for delivering the Army under his command into their hands, and secondly as I said before in his supersession by Suleiman Pasha. The Turks thus lost the only commander who had as yet succeeded in successfully opposing the Russians in the open field, and had at this period, where I propose to leave them for the present, let slip the best and really the last good opportunity offered them of breaking the Russian advance and forcing them back again across the Danube.

Sir Alexander Taylor, in returning thanks to the Lecturer, said that the meeting was indebted to Captain Anderson for a most interesting lecture, Captain Anderson had given not only an outline of the Campaign, but also showed the advantages which the Russians secured by their forethought and energy, as compared with the disadvantages under which the Turks laboured from their unpreparedness and apathy. Sir Alexander Taylor dwelt briefly on this portion of Captain Anderson's lecture and went on to say that a consideration of these points very forcibly showed the immense importance of entering on a Campaign with means fully sufficient to secure the objects in view,—with well matured plans and really effective transport. Humanly speaking, such preparedness was absolutely necessary to secure success, and he thought that this was a point which we, Englishmen might very often advantageously keep in mind (cheers).

There was only one fault he had to find with Captain Anderson's lecture, and that was, that it had not been given earlier in the season. Had that been the case Captain Anderson would have been enabled, subsequently, to bring the history of the operations up to the period of the arrival of the Russians before Constantinople. He hoped, however, that Captain Anderson would resume the subject next year, and at the

same time give some information as to the equipment of the which he thought would be very valuable (cheers).

H. E. Sir Fredk. Haines said there was one question he to ask which related to a rather interesting point. The Railways were well known to have been constructed on the shifting axles, and it was seen notwithstanding this little "*jim*" that they had been forced to adopt the rough, but more expedient of laying down a third line of rail to suit their gauge.

Did any one present know whether they really tried the axle, and if so, what was the result ?

The Hon'ble Sir A. Clarke said he had already been enquiries on the subject from which he concluded that the system had been tried and had failed. He however shortly expected further more complete information on the point.

The meeting then separated.

V.

TACTICS IN THE RUSSO-TURKISH WAR.

STUDY ON LONG RANGE INFANTRY FIRE BY GENERAL ZEDDELER.

Translated by Lieutenant Martin Martin, R. E.

General Zeddeler's observations on Infantry tactics and their modification on account of the present long range fire have occupied a good deal of attention among military students of all nations, and the following précis is taken from the General's own pamphlet which together with some criticisms on it was republished by the *Revue Militaire de l' Etranger*.

The General commences by treating of the fresh responsibilities incurred by officers and men on account of the dispersion now necessitated by the increased range and effect of the infantry fire of the defence.

He dwells on the difficulty of altering a direction once the troops are seriously engaged and on the necessity of the most precise instructions being given before launching troops in action, he details the losses suffered by the Russian Infantry in attack and the stupefaction and discouragement which even the best troops experienced in advancing over ground showered with an ever increasing hail of bullets from an enemy almost invisible, and dwells on the importance of allowing full liberty to the immediate Chiefs in the execution of such details in the attack as can only be dealt with by those on the spot. Assuming that infantry must now disperse and fire at greater distances from the position to be assailed he remarks on the importance of this being done coolly and without hurry or precipitation. Troops who are receiving their " baptism of fire " will always show some precipitation in their first " encounters with the enemy

" Ignorance of the real conditions of combat, habits contracted on the " exercise ground, on which results are speedily obtained which, on the " field of battle are only bought by a bloody and sometimes interminable " struggle, the fear of seeing the coolness and prudence, which must be " exercised, called by another name, and the desire to prove themselves, " such are the cases which push troops in action for the first time, above " all in a serious engagement, to throw themselves in advance and perform deeds of prowess much less frequently seen in their subsequent " encounters."

As in the British service we cannot afford to buy our experience by such losses as the Prussians suffered at Spichern and St. Privat, and the Russians at Gornyi-Dubniak, it would seem perhaps advisable to practise the advance from 2000 to 3000 paces oftener than is done, and at such a pace and with such halts in the movement as would probably be the case on service, when exhaustion, reinforcement, entrenchment, and casualties would necessitate frequent checks.

ADVANCE BY RUSHES.

On this point General Zeddeler has much to say and it is difficult to condense his remarks, which are all to the point.

Generally he advises the retention of the "quick-march" to within 1250 to 1000 yards of the enemy. Should this be possible, and covering parties having been formed to protect subsequent movements by high angle fire, he then advises that companies or even larger bodies should be carried forward at a run intact, to such points as may give them fresh vantage ground to form new covering parties again.

No rule can of course be laid down as to distances, but the ground should be carefully utilised and if possible scouted in advance; similarly no rule can be laid down as to the duration of the pauses between the rushes, our author, however, warns us against the demoralisation induced by too long checks under fire; the limit would thus seem to be imposed by the men's wind and condition, the increased severity of the hostile fire, and the possible necessity of entrenchments. Rushes may now have to be made even across hollows and ground defiladed from the enemy, for an intelligent defence will now appreciate these points, and having ascertained the range, "dead ground" can now be effectively showered with bullets, vertically fired, so as to cause grave losses to an advancing enemy.

With regard to fire during these rushes General Zeddeler advocates that all fire should be delivered at the halt, and at 1250 yards he advises that the covering parties formed to assist further advance, should fire volleys by companies at 1100, 1150, 1200 yards elevation and correct their range by the observed effect.

This seems difficult, and it will probably be more advantageous than ever to push guns to the front, from whose practice and observation the infantry may correct their range, and whose presence in advance, as the General observes in other places, is as ever morally beneficial to fire-tried infantry.

General Zeddeler also lays stress on the volley as, masked by its smoke, fresh bodies can be pushed unseen to the front, and again he remarks that a casual shot should be considered a crime to the man who fires it, every cartridge should be fired by command of a superior, and individual firing (might we not say indiscriminate blazing?) should be reserved for the shortest ranges. To keep men and fire in hand during

their employment such, says General Zeddeler, is the secret of modern warfare.

THE BAYONET.

As regards the bayonet in the final charge, the "hurra," bugles sounding, drums beating, etc. etc. General Zeddeler adheres to our system and recognises the importance of the thrust being given with both hands and not quitting the grasp with the left to gain a more distant but easily parried thrust as was the French and Turkish habit in the late wars.

The charge, however, should not be carried beyond the first line of entrenchments gained. Generally speaking the Turks occupied shelter trenches in front of their entrenchments proper, and the Russians driving in the advance and rushing forward loosely out of hand were often checked and repulsed from the main line.

Although no rule can be given, and all depends on the resistance and morale of enemy, it seems best to make the first line of entrenchments into shelter for the covering party which immediately opens a heavy fire from it on the works in rear.

From this point d'appui a fresh and solid attack can shortly be made on the enemy.

ENTRENCHMENTS.

These are, says our author, all important for attack and defence and were but scantily utilised by the Russians during the late war. This was owing partly to the what few tools there were being carried in the 3rd line of waggons instead of, as General Zeddeler recommends, being on the backs of every other infantry man (1 Tool to 2 men); but also partly owing to the companies of Sappers (and engineers) being as it were a fourth arm unknown to the infantry and not associated with them in peace, and imperfectly so in War. General Zeddeler proposes the permanent attachment of Sapper companies to divisions, and recommends that field entrenchments executed by infantry should be practised in connexion with a tactical idea not as isolated examples. In a few words—extended employment of infantry pioneers with more intimate connexion with the Sapper companies in peace exercises and war trials.

FLANK MOVEMENTS.

Whenever possible, flank, or turning movements should supersede or supplement the front attack. Theory can only diminish the risks but can never guarantee the success of this most difficult movement.

General Zeddele's conclusions are best given in full :

1. Infantry now fights exclusively in dispersed order, and the necessity for good training of troops in this particular imposes the following measures.

a. In all branches of instruction give the first importance to extended order; carefully accustom non-commissioned officers and men to the true conditions of this mode of combat.

b. Perfect the extended order and remove all hesitation in action from the orders and action of the commanders of the fire line; preserve the subdivisions of the company as far as possible in closed ranks, adopting the section as the smallest indivisible unit; and lastly oppose as far as possible the jumble of organised bodies with each other.

2. Increase the depth of the fighting order, for this reason increase the intervals between the lines and have one support more as immediate reinforcement to the fire line.

3. Do not use double files in the supports, open files rear rank covering.

4. In view of the difficulties attending extended order which have diminished the influence of superior officers; it is necessary under fire that orders should be full and clear and free from ambiguity.

The execution of details must be left to the immediate commanders.

5. As precipitation, especially with troops engaged for the first time, causes loss and danger, which may be avoided by care, it must be insisted on that every movement, every operation under fire should be carefully prepared before hand and carried out without hurry.

6. The conformation of all movements to the ground is more necessary than ever with the existing ranges, this observation applies equally to closed supports and to skirmishing lines, and has never yet been sufficiently attended to by the supports.

7. The advance by rushes is admirably adapted to the exigences of modern combat, but may become absolutely fatal if wrongly applied. Its employment is varied by a thousand circumstances and will be better appreciated and carried out when it is better understood by superior officers.

8. In defence and attack, fire always from the halt and not in motion.

At great distances employ volleys or file firing, at short distances well aimed independent fire, judge distances not by single shots but by volleys.

Adopt vertical fire in reaching an invisible or distant enemy, having for its object to cover with a shower of lead certain fixed spaces which he occupies in defence, or must cross in attack. Generally speaking modify our views on fire tactics, and replace, so to say, each single shot into the hands of the command.

9. Avoid unnecessarily thickening and reinforcement of the firing line; and to ensure balance make it sufficiently strong from the moment it enters the fire zone to be able to deal with the ordinary exigences of fire combat, and dispense with reinforcements other than those necessary on account of casualties, and those specially necessary to deal with certain eventualities which the fire line could not cope with unaided. The same order, regularity and obedience should be exacted from the fire line as from formations in closed ranks.

10. The attack is no longer made in the order prescribed by regulations, the regulations must then be modified. It must be firmly insisted on as a principle that troops must not allow themselves to be led on by a first success in pursuit of the enemy, but that after the assault of one position they must not advance on a second until they have prepared a new attack and are re-formed in order.

11. Generally speaking we should change our ideas of fighting, put fire-tactics in the first place and not shock-tactics, we should search out and employ every means to give the greatest possible development to fire, recurring to the bayonet charge when fire and other methods, among which action on the flanks holds the first place, are powerless to reduce the enemy.

12. Field fortification and shelter trenches in defence and attack having acquired from the power of modern fire a special importance; we should develop in all infantry bodies the capabilities of pioneers, adopt unhesitatingly a portable tool, attach a sapper company to each infantry division, and lastly—

Take means to pick up the arms &c., left on the field by the dead, the wounded, and the enemy; these should be collected by detachments of non-combatants at certain depôts. At the same time no man should, without orders, throw away any article of equipment.

The very intelligent criticism which follows the translation of General Zeddeler's observations on long range fire in the *Revue de l'Étranger* enlarges on the increased possibilities of infantry fire as an assistance to artillery preparatory fire in the long range attack on positions, and while acknowledging that increased precision and range gives a *primâ facie* tactical advantage to the defence, denies that this is real, as increased range will enable the attack to operate on a wider arc, and while containing the enemy with the distant but still destructive fire of a screen, the real attack can be directed with larger scope to manœuvring than before. Shortly, the strategical gain to the attack is more valuable than the tactical gain to the defence.

Very truly also, the critic observes, that each new improvement has been foretold as the death blow to the attack, but that in each of the three last wars of -66 of -70 and of -77 it has been the attack that has eventually triumphed over the less supple defence, and all the vapourings as to the impossibility of assault have vanished with the first gun shot in action.

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By order of Council,

A. D. ANDERSON, CAPT., R.A.,

Secretary, United Service Institution of India.

SIMLA. }
1st April 1879. }

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The Secretary will be happy to send an Index to volumes I, II, III, IV, V, VI and VII to any member wishing for the same.

A. D. ANDERSON, CAPT., R.A.,
Secretary.

ORIGINAL PAPERS.

I.

THE MOUNTAIN ARTILLERY OF SPAIN,

BY THE LATE

SR. DON MIGUEL VIDAL Y MONTENEGRO,

Major of the Spanish Artillery.

TRANSLATED BY PERMISSION

BY

LIEUTENANT J. C. DALTON,

Royal Horse Artillery.

TRANSLATOR'S PREFACE.

I am indebted to the kindness of my friend Sr. D. Ricardo Vidal Y. Montenegro, Captain and Brevet Major Spanish Artillery, for the permission to translate the accompanying pamphlet, written by his brother.

The Mountain Artillery is generally considered to be the most perfect branch of the Spanish Artillery, it being especially suited to the nature of the country and thoroughly understood by the Officers of that arm. The men selected for it are the finest and most powerful men in the corps, the animals used are mules and horses; the former to carry the gun, carriage, ammunition, baggage &c., and the latter for the officers, trumpeters, senior N. C. O'S. &c.: as the mule plays such an important part in securing the efficiency of this branch of our profession, too much attention cannot be paid to studying and thoroughly learning its habits, more especially as it is by no means an easy animal to manage.

A large portion of this pamphlet is therefore devoted to a treatise on the Mule, his habits &c. and as we employ this animal largely in our colonies, and should still more in case of war, any information, coming as it does, from those that understand the subject should be useful and instructive to us.

It is not unlikely also that mules may be imported to England for transport purposes, in fact one ship load has already arrived in the

country. The second part of the work describes the *personnel* and *matériel* of a battery of Spanish Mountain Artillery.

J. C. DALTON.

EXETER. September 1878.

MOUNTAIN ARTILLERY.

ON THE RELATIVE MERITS OF ANIMALS FOR TRANSPORT.

The Artillery most capable of mobility is "Mountain Artillery;" it is conveyed over difficult and broken ground on the backs of animals.

In Spain the mule is best adapted for this purpose; other countries use also the elephant and camel, the latter might be tried in the Spanish possessions in Africa for the service of some batteries, but only in case of another war with the Moorish Emperor.

There are various classes of animals of the equine species in Asia and Africa, but not one of them can be properly domesticated. They are, *Hemion* or *Dziggtai*. The wild mule mentioned by Aristotle, in appearance between the ass and horse; bred in Cutch. In Bombay it is used as a beast of burden but it is very ungovernable on account of its extremely fiery disposition.

Zebra. Very like mule in form but differing in the colour of skin which is striped white, blue and black. Only found in South of Africa and Cape of Good Hope. Also most ungovernable.

Diuw (*Equus Zebra*.) Smaller than the ass but more fleet. Ungovernable, fiery and bad tempered, No use as beast of burden. Found in the most arid places in centre of Africa.

Quagga. Small, only lives in South of Africa and being so rare, its capabilities are but little known.

Onagro or Koulas. Bred in Tartary—very ungovernable. The Kalmucks, Persians and Tartars hunt them down and eat their flesh.

As may be seen none of these five varieties are acclimatized in Spain and are therefore generally unknown, the mule being accepted without discussion.

Mule, the issue of a mare by a jackass; and the *Hinny* or *Jennet* the issue of a she-ass by a horse.

The mule like its fathers belongs to the same genus as the horse, it is of the family of the *Solipedes* (whole-hoofed) of the seventh order Paquidermos (thick and hard hide), mammiferous, vertebrated. The antiquity of the mule is unknown. The first mention of it in history is in the passage describing the flight of Absalom (when defeated by the army of his father King David) who being carried by a mule was left hanging in a tree by his hair in his precipitate retreat. This animal is

produced by man's caprice. As the descendant of two distinct species, the ass and mare, it is called a *hybrid*. It is not found wild in nature, though there have been travellers who have stated that herds of wild mules were to be found in Paraguay. It is difficult to believe that these mules were genuine productions of nature and that man's agency did not intervene to produce them, for the reason, that when they are brought together, it is necessary to excite the jackass by bringing him a female of his own species, before he can be got to serve the mare; and in a state of freedom there is no doubt that the jackass would seek out one of his own species to breed with in preference to a mare.

There is a diversity of opinion as to whether the male and female mules are sterile or not. In the "Agricultural Dictionary" edited by D. Augustin Calderon Collantes 1852, the following appears, "The he-mule is barren. The female is fertile either with the horse or jackass, though the he-mule cannot fertilize either the mare or she-ass."

Opposed to this, *Chao* in his Natural History says "Aristotle says positively that the union of the mule and mare produces an animal called by the Greeks *kinnus* or *ginnus* (jennet). He adds that the she-mule can conceive but very rarely bring forth a perfect issue."

Various cases are quoted of such unions with good result, and the treatise ends thus "There remains no doubt that the he-mule can beget and the she-mule produce. that these animals are always more dilatory than the pure species, and that they generate better in hot climates; they have never been known to produce in cold climates."

Be this as it may, in order to obtain a strong mule well adapted to the rough work it is destined for, it is necessary to cross the mare with the jackass.

The hybrid thus obtained inherits the qualities both of its father and mother; from the latter it derives its big and voluminous body, from the former its strength and hardy phlegmatic disposition, which quality renders it admirably adapted to work in the fields and to bear the fatigues of heavy transport.

The mule compared with the horse, which is its typical species, does not differ the least from it in internal organization.

In external organization there are many points of difference, viz: the mule has greater length of ears, eyes less bright and intelligent, lips thicker, jawbone more *viscous*; the forelock, mane, tail and hair coarser, the tail being shorter also than the horse's: the neck less thick, shorter and straight at the nape; chest narrower, shoulder straighter, the arms less muscular but more sinewy and resisting than those of horse: the hoofs are small and being somewhat high-heeled have the appearance of being contracted, they are however well suited to narrow and stony roads; the back is straight and the hind quarters low, the hips generally are defective and the animal is cow-hocked.

The mule is more capable of resisting fatigue than the horse, though less supple and active in its movements. In racing and leaping the mule can compete successfully with the horse as has often been proved in the towns of La Marina, a province of Alicante which possesses mules of a very superior and handsome breed.

The circumstance of their having a straighter shoulder and back than the horse renders them more acceptable and preferable as beasts of burthen. The small foot and dragging action makes them especially sure footed and valuable in awkward and uneven paths, the horse not being to be compared with the mule in this respect; the mule very rarely falls on bad ground, though on a good road he frequently stumbles. The elastic nature of the horn of the hoof preserves it greatly on bad ground which would seriously injure a horse's hoof. The shoeing of a mule does not require half the care that a horse's does, and the shoes are cheaper and take fewer nails—the shoes also last longer because the mule treads so gently and lifts its feet such a short way. The hind shoes wear out at the toe first because most mules are "*topinos*" that is to say, they tread on the point of the toe and dig it into the ground, especially when level. For this reason carts drawn with mules raise more dust than with horses.

The mule is very frugal in its food and drink, being able to go without water throughout the hottest and most fatiguing day. Its sense of smell must be less acute than that of the horse, for what the latter refuses, the former will eat. It is a common idea that the mule will not drink the water left in a watering trough by horses, but this cannot be confirmed, as the contrary is so often seen, and the mule will drink water equally well before or after horses have touched it.

It eats with less daintiness than the horse whatever is given it such as beans tares, maize, greenstuff, and even the soldiers food. It gnaws wood work and partitions and whatever comes within reach of its teeth if the manger do not contain the quantum of food, for this reason it is advisable to have the halter made of raw leather slightly greased.

The mule is less sensitive to weather than the horse, sun and rain make its hair coarse, the colour changing to a reddish hue and like the hair of a wolf giving the animals the appearance of wild beasts. Its skin, harder and less sensitive than horses, is less affected by blows, or the stings of insects; but wounds and sores take a long time to heal from the very fact of absence of life in its epidermic organization. The mule is less liable to sickness than horse, but when sickness does come, it is more acute, especially if the blood be affected as in strangles, inflammation of lungs, glanders &c. It does not appear to suffer much from cuts or cracks in the hoof, but if these are neglected, eventually the horn gets effected and the animal becomes useless.

It lives as long or longer than the horse, and its market price is generally lower.

To sum up the above comparisons; the mule is much more suitable than the horse as a beast of burthen, and experience shews that the he-mule is capable of carrying more weight than the she-mule or the jackass; hence it is the most useful animal in Spain for transport purposes.

The colour of mules is generally dark brown or chesnut, many being speckled, the black mule with a completely black head is called a "*Mohino*"; the chesnut mules have a strip of darker colour the whole length of the *Vertebral* column which mark is called "*Raya de mulo*" and the mule is termed "*rayado*" (streaked): if there is a cross streak at the withers down to the shoulders this mark is called "*raya de mulo-cruzada*" (cross streaked). There are light chesnut mules with the streak very strongly defined, also with darker and almost parrallel streaks on fore and hind legs; they are called in Spain "*Acebrados*". The prevailing colour is chesnut and it is a very rare occurrence to find mules with a star on face, or with white legs and feet (*estrellados* and *calzados*).

The mule when treated properly and kindly is docile and easily managed, he is as regular in his routine as the jackass and therefore becomes obstinate and troublesome if anything breaks in upon it, he knows a road after traversing it a very few times, and recognises in a moment the building containing his stable. He accustoms himself to the man who looks after him, and much dislikes other persons approaching him even though they may come to feed him. His sense of hearing is such that he can hear the slightest sounds, he recognises his master's voice and the ordinary trumpet sounds, and becomes animated by music and energetic songs or shouts. He is very fond of finery and shews much more animation when decked out in colours, ornaments, bells &c. He is clean and avoids dirtying himself more than is necessary; still when overcome by fatigue he accustoms himself to it. He is fond of bathing and above all of rolling in the dust. He sleeps 3 to 4 hours a day, his soundest sleep being taken about dawn; if he sleeps standing up he rests the near fore and off hind, throwing his weight on to the other two, and *vice versa*, he lowers his head bends one ear forward and the other in the contrary direction in order to be able to hear any sound; when overcome with sleep he closes the eyes, if however he is only dozing he keeps both eyes open but without seeing objects distinctly, the power of the organ of vision being blunted. During the night, if rested from his fatigues, he remains awake, in many cases fidgetting and pawing the ground until his feed of chopped straw is given him. The voice of the mule, composed of the sharp notes of the neigh and the deeper and hoarser notes of the bray is well named "*greli buzno*" (or composed of both sounds).

This note is repeated with more persistency when the usual hour for feed approaches, and his pleasure is shewn by the shrillest and most tremulous cries. He is quieter on dark nights as is the case with most quadrupeds, and he generally when on the march testifies his pleasure at

the sight of inhabited places or villages. Weariness makes him lower his head until his neck is horizontal and he droops his ears which fall to each side and move keeping time with his paces. This symptom is infallible to estimate the degree of fatigue the animal is undergoing; the strongest mules are the last to droop, or as it is commonly expressed, "fan" the ears (*abanicar los orejas*). When this symptom is observed it is folly to try and exact more work. The mule shews the state he is in by the action of his ears, and if they continue moving with a tendency forward, accompanied by a fixed expression of the eye the animal is still vigorous. Fear causes him to utter peculiar sounds from the throat and nostrils, his hair stands up and he tucks his tail in as tightly as possible; very frequently he bolts and it is necessary to proceed very carefully and use blinkers. His mountainous rusticity renders him more sensitive than the horse to the caprices and crotchets of his master; he strongly resents ill-treatment; oppression discourages and weakens him, too much castigation disgusts him to such an extent that he refuses his food and becomes distrustful and treacherous to a degree. Good treatment and kindness in breaking-in make a fine mule, but blows given at the wrong time and without judgement, and breaking-in more by force than by kindness, will damage a mule beyond reclaiming. The men whose duty it is to look after the animals must be patient and not frighten the mule, going up to him timorously deceives him and makes him think that castigation is being prepared for him and accordingly he puts himself on the defensive. It is necessary to display the greatest tact and tenderness with young mules, taking care not to resist their desires at once, but to employ stratagem and artifice before brute force, for shoeing harnessing &c.; if they are once permitted to contract evil habits, the difficulty is to get them to forget them and vice is soon acquired.

The ruling passion of the mule is luxury and this causes his quarrels and paroxysms. Eminently impetuous in anything affecting his appetites, he gives much trouble to those who look after him as well as to the other animals in the stable, if these are not satisfied. The smallest obstacle to the realization of his desires will cause him to kick and bite whomsoever opposes him; in his fury he has been known to pursue horses long distances at a gallop, and appears to have a particular aversion to those that are speckled or light coloured. The season the she-mules come in season, is spring after which the mules are much quieter.

The mule, like the jackass, is to a certain extent torpid, and incapable of learning equestrian exercises with the facility the horse can; moreover his mouth is too hard for the bit, and this accounts in a great manner for this inaptitude.

The ordinary duration of life is 15 or 16 years, some attaining to 20 or even 30, but very few passing the latter age.

The best mules are obtained in the French Pyrenees, and they are bred in the districts of *Aran Seo de Urgel*, and *La Cerdaña* to which

places the dealers proceed in search of them and import them by the shores of the Mediterranean as far as *Andalusia*; another batch of mules cross the province of *Huesca* and are distributed about the banks of the river *Ebro*. These animals which journey as far as the South, fine down and get much lighter in form.

In *La Mancha* there are some excellent draught mules, but more suited to light draught than to carry heavy loads. In the year 1578 the fondness and taste for mules increased so much that the Kings Philip II and III and Charles II issued decrees to stop such an abuse as it greatly deteriorated the breed of horses. In the present day, notwithstanding that Spain is a country specially adapted for mules both from its climate and from its possessing numbers of very large jackasses, mules are decreasing in numbers, and those bred in the country are not particularly fine specimens. In the South of France, bordering on the Pyrenees, one mule or two are bred in each country house. Referring to this, D. Joaquim Enrile in his "*Prontuario de Artilleria*" (Memoranda of Artillery) says, notwithstanding the advantage our country gives for breeding mules, it is indisputable that a great number of the mules used in Spain come from France, in which country little use is made of them and they are bred solely for sale.

We will now briefly consider the method adopted in that country for breeding and keeping these animals.

The Spanish Government permitted the exportation of jackasses, the monopoly of which it had strictly preserved in the strictest manner. The French Government longing to make some comparative experiments, formed establishments of these animals in different parts of the kingdom; but whether from ignorance, negligence, or the effects of circumstances connected with those localities, the fact remains that the only provinces which reap any benefit from breeding good mules, are Gascony and Poitou. By degrees these places have raised studs of the best animals of the jackass tribe; all the proprietors, and the greater part of the tenant laborers possess one or two great, strong and healthy mares with deep chests, great capacity and bone, which when well kept and cared for are destined to breed mules. In Spain there are very few small farmers who devote themselves to mule breeding and such as there are, are for the most part ignorant, they possess bad sires which produce weakly and low priced stock.

The mule is used more in the Catalan provinces than in any other part, also in the mountainous districts of *Andalusia*, in some villages on the sea Coast, and in the province of *Alicante*. Eminently in those districts as on the slopes of the Pyrenees, the mule is the best motive power for Commerce, and the carriers are very intelligent in their care of the mule and possess as fine and strong animals as there are in the Peninsula.

The food consists of maize and hay or dried grass, of which there is abundance in those villages; a food most wholesome and nutritious,

which, while maintaining the animal in good condition for work gives a fineness and gloss to the coat. It is in this country where most use is made of pack animals and most care and intelligence shewn in the management of the mule.

Selection of mules for pack animals.

The more the animal approaches to the stamp of the horse, the more valuable are the conditions united in him ; those that are good looking, neck like a bull's, broad chested, and fine in the legs are particularly useful provided that they are thoroughly sound. Those that are narrow chested and big bellied are excluded because they are weak and gross feeders. The good mule possesses a bright eye and keeps the ears and tail in continual motion when at work. When he is pulled up and delayed, he stands in the position most comfortable for himself, raises his head and observes all moving objects with attention ; he shews impatience if left alone. ●

There should be a good length between the point of the shoulder and the withers which when accompanied by a broad chest denotes vigorous lungs. A moderate sized barrel denoting a small volume of intestines and small weight in abdomen are symptoms of fleetness and abstemiousness. Large hocks and knees are a sign of solidity and firmness in the four columns of support, which by architectural rules have to correspond in strength to the capitals. Generally mules are somewhat cow-hocked, which defect does not diminish their resisting power. The back straight and slightly arched accompanied by a fullness of the ribs gives the effect of a solid arch. Hollow backs are more suited to draught than to packs. The she-mule and gelding mule are slightly hollow in the back and the muscular force of the hind quarters more developed, so that mechanically considering them one may say they are more suited to draught than for pack-animals. As may be seen in Bolognese and other types of agricultural horses, in order to get the full power of traction, the back assumes a humped form ; recruiting or knitting the intercostal muscular system. Thus all the quarrelsome mules nearly are good workers because they possess a sanguineous, nervous temperament, very favorable for those energetic muscular contractions which, the body being unencumbered with fat, are imparted to his movements rapidly and without loss of force.

Age. During the period of being suckled, the young mule is called "*lechál*" or "*lechuzo*" to 8 or 9 months old "*muleto*" which it continues to be up to 5 years old, when it changes its milk teeth and becomes "*mulo*" and is full grown ; before the age of 5 its bones are soft and the extremities, cartilaginous, for which reason it is unadvisable to overload or overwork young mules. The mules mouth is more irregular than the horse's and more difficult to tell its age by, the teeth are harder and offer more resistance to the rasp ; much practice and intelligence are necessary to tell the age by them with any exactness.

The *lechuza* has to be large of limb with plenty of bone, coarse and shaggy in appearance, many muleteers cut the mane and tail and clip the body in order that the hair may grow thicker and stronger; moreover at the age of two years the tail reaches to the hocks, at 3 to half way down the lower part of the legs, and at 4 to its full length; by these means the age of the *muleto* can be easily estimated without looking into the mouth.

Muletos are of no use for the army as they are not strong enough, moreover like the horse, the mule should be quite efficient in the army before he is taken for active service. Young mules and colts consume food to the prejudice of the state, they cause vacancies in the ranks and occupy the time of many men to look after them and often cause damage. The mule should enter the ranks, thoroughly broken and from the age of 5 to 6 years. The soldier does not take the same interest in the breaking in and bringing up of mules as the peasant who does it for his own gain; hence the mules of a battery are often more intractable and obstinate than those of private individuals. In spite of the great care and vigilance of the battery officers, it is impossible to prevent some of the men from beating and ill using their young mules and this is the cause of constant struggles and contention in its management and treatment; once the mischief is done it is irreparable and the master finds a perpetual enemy in the vicious mule.

The mean period during which the mule works well is 8 or 9 years; supposing him to have commenced work at 5 years old, he will last on till 13 or 14; it is very rare to find mules capable of withstanding the fatigues of active service at the age of 16. Forced marches, frequent halts during which the mule remains loaded, the uncertainty in the time between the feeds, suffering from hunger, thirst and bad stabling, are causes which contribute greatly to the decadence of the animal, however strong he may have been. It is necessary to employ him during the period of his full power and strength in order to lessen the number of sick and dying mules.

At 5 or 6 years old the mule is perfectly formed, at 8 he is in the full possession of his strength and vigour, his decadence begins at 11 or 12 though very imperceptibly; when past 14 or 15 years he must be sold and he may bring a good price being quite capable of quiet slow work in the fields where his life would be perfectly regular; though a military life would suit him no longer.

A battery whose animals were more than 12 years old although it might be very efficient in peace time, still when ordered on active service would have to get remounts as rapidly as possible especially if they had the constant work which they get in Cataluña.

The best and most convenient distribution of age in a battery would be in 8 or 9 groups of mules from 5 to 13 or 14 years old; by this means the mules would be cast in normal epochs of 8 or 9 years and at the

completion of 8 or 9 years the whole battery would have been renewed; for example a battery of 49 mules would cast annually 5 to 7.

If the animals are good, the treatment careful, the stables good, the exercise constant and moderate, and the food occasionally varied the annual number of unserviceable animals may be greatly reduced.

The mule in his old age if he has been much used as a pack-animal breaks down in his feet, his kidneys get affected, he stumbles frequently and becomes lazy and feeble; when stimulated to move, he sweats more than young ones. In fact, like a machine, he suffers from deterioration in all the parts used. His aspect changes slightly—the ears fall to the sides, the eye loses its brilliancy and motion, the sockets sink, the snout elongates and the under lip droops. The old mule eats as much or more than the young one, but does not profit proportionately, owing to incomplete mastication generally caused by the bad state of his teeth, and from not chewing his food properly, many grains being swallowed whole; and as the stomach and intestines have lost a great amount of their digestive power, the assimilation of substances is slow and incomplete, much therefore passes through the animal undigested. In cases of this kind, it is desirable to give the grain crushed, with a little salt added to stimulate digestion.

The “*garrofa*” or “*algarroba*” (smooth tare), a food much used on the coasts of the Mediterranean, injures the teeth greatly on account of the quantity of saccharine matter it contains, and its effects are soon noticed if improperly used, giving young animals the appearance of old ones and making them thin and poor.

Height. The general rule is that muscular strength is in direct proportion to the size of the animal. It is important in a battery that the animals should be as far as possible of the same size, as the bridles and pack saddles are all of one size and if the animals varied much in shape, for some they would be too big and for others too small, the result of which would be galls, inconvenience in adjusting certain loads, causing delays on the line of march and constant work for the drivers to re-adjust pack saddles &c.

Big mules are inconvenient, the lading of the guns and carriage is difficult for the Gunners, longer girths are needed, the mules cannot easily get into the ordinary village stables with their load on, on account of the low roofs and small doorways and this renders it necessary to unload in the streets with the risk of the animals catching cold in cold and damp weather; also such big mules are difficult to manage, even for tall men and need more food to keep them in good condition. The very big mules are generally weak in their limbs, it being difficult to get them well proportioned. The most serious drawback to small mules is, their not being very strong, they are generally better formed than the big ones though somewhat narrow chested, the pack saddle covers the

shoulders and embarrasses their movements and is liable to gall them over the loins and withers.

The most convenient height is from 14 to 14½ or 15 hands beyond which limits they are not very suitable; it is the most usual height for mules in any district: and it being proportionate to that of the gunner, the putting on and taking off the packsaddle is much facilitated; the harness also can be shifted from one mule to another without having to punch fresh holes in the straps; more uniformity in formation is ensured and the detachment can assist to support the weight easier when coming to awkward places &c.

Colour. The only colours, that should be seen in a battery are chesnut and black; grey mules offer too plain a mark to the enemy, especially at night. Light coloured mules shew dirt too plainly and give much extra work to the drivers who have to keep them clean.

Castrated mules. It is a disputed point whether or no it is desirable to geld the mule before he is taken for military work. He is castrated not that he may become stronger but that he may acquire more docility and become less quarrelsome. The advantages of the gelding, are more docility, quietness and silence than the entire possesses; the disadvantages are slight, but with some are, less power in back, less agility of movement, slower walk and more need of sleep. Gelding mules also get tired sooner than the entire and sweat more, also wounds and galls take longer to heal.

Castration is dangerous and may kill the animal or injure it for life, unless very skilfully performed. It is also certain that with an equal number of entire and gelding mules of the same height and shape, there are more first-class mules among the former than the latter.

The most prudent plan is to get the mules entire, and then, if it is absolutely necessary, castrate them afterwards as a last resource. The remount mules given to the 1st. Regiment of mountain artillery in January 1874, of which the greater number were geldings, were not satisfactory for field service, but whether they had been badly castrated or were naturally feeble one can't say.

To sum up, if a mule is of good shape, height and species, can carry a weight of 16 to 20 "*arrobas*" (the arroba is 25lbs) on marches of 10 to 12 hours with a small amount of food for several consecutive days, that mule can be said to be in the first class. But if at the end of the first day's march, he shews symptoms of exhaustion, or the second day is observed to trip and flag, get off his feed, and shew signs of tenderness on the back, this mule however good looking and handsome he may seem to be, can never be placed in the first class, but in the 2nd, or 3rd, as will be explained hereafter.

(To be continued.)

II.

STUDIES ON THE PROBABLE COURSE AND RESULT OF A WAR BETWEEN RUSSIA AND ENGLAND.

Written in April, 1878,

BY

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ENGLAND is determined on war ; it is not a question of the interests which are supposed to be wrapt up in the integrity of the Turkish Empire that now makes her stand sword in hand, these interests could also be made secure were Russia to take the place of Turkey, but it is her precarious position in the East which forces her on irresistibly to war.

Without a preponderating position in the East, her possession of India cannot be maintained ; and, without India, England would very soon be reduced to the position of a second-rate European power, notwithstanding the fact that her population is almost equal to that of the most powerful states in Europe, otherwise she must consent to an entire change in all her political institutions, which at present are incompatible with universal military service, and equality of privileges among all classes.

On this account England is compelled to maintain her influence in the East, and by war to force Russia back, if only partially, from the position which, step by step, she has won for herself, and which already has proved prejudicial to British influence.

England is determined on war, and all the intermediate negotiations are only undertaken to gain time and to complete her armaments.

With what forces then will this war be waged ?

Formerly England always carried on her wars in alliance with other European States who provided their own troops, and with whom she acted either by means of a contingent or by subsidies. In the days of mercenary and professional armies this enabled her to play a prominent part in all the warlike complications of Europe. At present, however, with the universal military service, which all European States have introduced, this is no longer practicable. It is now impossible, even with the most enormous sums, to bribe any great power to act as an ally and a champion. It is only when her individual interests are at stake that a country will decide on war; then will she consent to hazard the blood and treasure of her people to secure their safety. There is, however, no great State which has interests of so important a kind in the East as to cause her to join, whether as ally or champion, either of the combatant States—Russia or England.

Germany and Italy are entirely out of the question, their interests in the East are too insignificant to justify their taking a share in the war, in fact it may be said that they are only interested in granting freedom to the European inhabitants of Turkey from the oppression of Mahomedan rule. In this they go hand in hand with Russia, and England can in no way count on their assistance.

France has already once been the ally of England in a war against Russia, but then it was in the interests of the dynasty, and not of the state. Since that time the benevolent neutrality of Russia has become an object to her in order that she may actively prepare for the war that is before her: and, although the interests of France are by no means considerably affected by an entire change in the ruling power of Turkey, still, Russia will be glad honestly to consider those interests, more especially as they will in no way interfere with her own. Thus England cannot count on France.

Austria remains to be considered. This state has but few direct interests in Asia, but the most important possible interests in Turkey itself, since the Danube is the principal line by which her commerce can reach the Black Sea, and thence it has to pass through the centre of Turkey by the Bosphorus and the Dardanelles to the Mediterranean, the market of the world. It cannot, however, be said that Austria is interested in the integrity of Turkey, which, for hundreds of years was her worst enemy. She is only concerned in the safety of this channel of commerce which was so carefully guaranteed by the Treaty of Paris. Should her commerce be secured through other means of exit, or should it be possible to open a better, shorter, and hence a more convenient and cheaper commercial route to the Mediterranean it would be wholly immaterial to the Court of Vienna, which power ruled at Constantinople, always provided that no one of her neighbours thereby become so powerful as to imperil the existence of the Austrian Empire, but should Russia conquer the Porte, Austria thinks that this would be the case. If, on the other hand, European Turkey should be broken up into small States, which could not long avoid falling under the influence of Austria

with its great power on their borders, and should she herself get possession of Bosnia and Herzegovina, through which might be opened the shortest route to the Mediterranean, in that case her interests would be fully secured, although strong national Hungarian prejudices may at the present time think otherwise.

The Czar can offer these advantages to Austria, while England, who, under the pretext of maintaining the integrity of the Turkish Empire, would go to war with Russia in order to maintain her own position in the East, can by no means do so with equal completeness. Austria will, therefore, probably maintain towards England a benevolent neutrality, while at the same time she will watch attentively the course of the war, but will take an active part in it only in the event of Russia attempting herself to take possession of Turkey when it lies at her mercy ; at present, however, there are no signs whatever that this will take place. Hence, England cannot count on Austria.

Therefore, in a war against Russia England must rely on her own resources, to which, at the most, those of Turkey may be added.

In what then do these resources of England consist ?

Great Britain is by far the most powerful state of the world, so far as relates to extent of territory and population.

Russia is, perhaps, her only rival as regards territory, and China as regards population. But the dominion over these enormous possessions and these innumerable inhabitants is vested in the British Isles, which, with the exception of Italy, are smaller, both as regards extent and number of inhabitants, than any other great European state. The wise policy which has granted to all her colonies entire freedom and independence, exempt the mother country from being obliged to afford to these lands anything more than a nominal protection ; she is, however, thereby strengthened and enriched by extended commercial relations.

North-America, Australia, and, at no very distant period, also the far-spreading possessions in South Africa, require from the mother country but few sacrifices, while they confer on her proportionately far greater advantages. As a fact, they can afford but little assistance to the mother country in a war with Russia, although they could give her pecuniary help, an important matter in war, which removes what is always the greatest difficulty.

In addition, however, to these countries, England also possesses India, which is by far the greatest and most costly of her possessions, by far the most productive source of her wealth, and the strongest support of her position in the world. With India, England is the greatest power in Asia ; without India she is still a formidable State, but were she to lose that country she could hardly maintain her present position, and her greatness, which is so dependent on her commerce and manufactures, would receive a blow that it could scarcely survive.

England has fully recognised the immense importance of this possession, inasmuch as she has created the Queen, Empress of India. Of the 170 millions who inhabit this country 120 are directly under British rule, while the remaining 50 millions are under native princes, who are dependants of the British Crown; hence is it well-suited to take an important and immediate part in the struggle between England and Russia.

All these distant lands are connected with England by the sea alone, and are united into one whole by the bond of union—the commerce of the world—and the guardian of this union, the strong hand with which all these separate limbs are held together over the expanse of ocean, is the British Fleet, the proud Queen of the Seas. It is principally on this mighty fleet, on its hitherto undoubted pre-eminence in armament, in efficiency, and in the excellence of its officers, that England relies to carry on a war with Russia.

Russia also possesses a powerful fleet, but at present and for a long time to come she will not be in a position to engage in a contest on the open sea with the English navy, which is three times as powerful. Even in its own waters in the East will it scarcely attempt to contest British supremacy. What then are the advantages which England can expect to derive from her fleet in a war with Russia?

Whoever commands the sea has in its power all the communications which can only be maintained by water transport. If portions of a State are separated by water, and should it go to war with another power which commands the sea, it will find portions of its territory isolated, and will thus run the risk of being defeated in detail. The possessions of Russia, however, are not separated by the sea. The Caspian, which much facilitates the communications between various portions of the Empire, is so entirely enclosed by land that the English fleet cannot enter it. Hence Russia has nothing to fear, and England nothing to hope, in this respect, from marine superiority.

Still further, whoever commands the sea can land troops on any point of the enemy's shores and can carry war into his country. As Russia has extended coasts, for England this is an important advantage, which is equivalent to actual numbers. The state which is exposed to the attacks of the enemy must have sufficient troops ready for the defence of its shores, so as to be able in a short time to oppose the landing of an enemy with superior force. It will then be in a position to attack him immediately on his landing, and to inflict such losses as to necessitate immediate re-embarkation and prevent another descent in the same neighbourhood. The forces which the State thus threatened has to keep in readiness must correspond with the number of the troops, which the enemy has at its disposal for a landing, and must be available at each one of the points on her coasts that are far distant from each other.

The longer the sea transport the more difficult is it to place a well appointed army of the three arms in an enemy's country.

The coasts of Russia are everywhere very distant from England, and even with the enormous resources which the latter possesses in its war and mercantile marine, it would scarcely be possible to place more than 30 or at the most 40,000 men on any point of the Russian coast. The choice of this point is entirely in the hands of the fleet, but at the same time the place selected must be suitable for the disembarkation of an army, and, as for this, special peculiarities of ground are necessary, the choice of such points is limited, and the defenders can have, ready prepared beforehand, at each likely point ample means to resist a landing.

The first requirements in the point where an army should be disembarked is that there should be shelter, since disembarkation can only be carried out in smooth water. The second requisite is, that in the neighbourhood of the place selected there should be ground not only suitable for conversion into a defensive point, but also that it should be so calculated to favour an offensive attack being made from it. The third necessity is that there should be within reach an objective point whose loss would prove a signal disaster to the enemy.

Should any of these conditions be wanting, either the disembarkation of the army is impossible, or, should it be carried out it will have but little influence on the course of the war.

The Russian coasts on the east of Asia, and those to the north on the frozen sea, do not fulfil the third condition for a successful landing. Neither the capture of Kamschatka, and the mouth of the Amoor, nor that of Archangel would exercise any appreciable influence on Russia. One may therefore entirely put aside both the defence and the attack on these districts in any consideration on the result of a war between England and Russia.

Then there only remains the coasts of the Baltic and those of the Black Sea, for the defence of which Russia must have great forces at her disposal.

In the Baltic the northern coast of the Gulf of Bothnia may be left out, since it is impossible thence to reach any important objective point, and the southern coast, that of Courland may also fall under the same category, as it is too wet and sandy to be suitable for the disembarkation of an army. It therefore results that only the district from about Abo on the north to about Riga on the south, has to be protected. All the good harbours in this district are fortified, and St. Petersburg lies so near the centre of it, and is so connected by railways with every point, that the ordinary peace garrison which is considerably over 60,000 men, is amply sufficient to render even a successful landing a far too hazardous operation.

Besides there is stationed here, protected by the strong fortresses of Sweaburgh and Cronstadt, the entire Russian fleet, which would utilise any opportunity which might occur through rough weather or otherwise, to make sorties on the enemy without seriously compromising itself.

The protection of this line of coast, if Russia were at war with England alone, would likewise require but a small expenditure of strength, and would not make it necessary to spend a single penny beyond what is usual in time of peace.

It is however otherwise with the coast of the Black Sea, supposing that it is accessible to the British Navy. Probably this will be the case, since if England now declares war, it will have Turkey as an ally, and the latter will do all in its power in conjunction with the English fleet, which is already on the spot in the Sea of Marmora to keep open the Bosphorus and the Dardanelles for the English transports, although at the present time the Russian Army is encamped close to these straits. At the commencement of the war the fact of this Russian army being so near, would prevent any considerable body of English troops being available for a landing in the Euxine, all such troops must first be employed in attacking the Russian army, and it is more than doubtful whether they could do this with success. However, as a war with England is always a tedious one, it is possible that during its course Russia will have seriously to consider how the shores of the Black Sea may be best protected.

The mountain range of the Caucasus rising abruptly out of the sea, divides the Russian coasts into two portions, of these, one includes the Crimean peninsula as far west as the mouth of the Dneister, with Odessa as the central point, the other includes the coast of Georgia, with Poti as a centre. In order to protect the former portion 60,000 men would amply suffice, provided that they are collected here and specially destined for that object, and for the latter which lies immediately in the neighbourhood of the trans-Caucasian army, a smaller force, say, perhaps, 30,000 men would be enough, these, however, need by no means remain inactive in the event of war being likewise carried on with Turkey. If we therefore calculate up the forces which Russia must have ready to protect her coasts in the event of a war with England, and which would as a rule not be disposable elsewhere, it appears that at the most 150,000 men would be necessary. If Russia can spare this force, and can still carry out her other military operations, England has no further advantage to expect in this respect from her maritime superiority, and cannot by this alone force Russia to make peace.

It may be added that whoever commands the sea, can in addition blockade or destroy the enemy's merchant navy, and can entirely put a stop to any commerce that is carried on by means of sea transport. This, however, is by no means a direct or decisive means of carrying on war, it has however this power, that of cutting off from the enemy, all the resources which depend on an extensive trade, and under some

circumstances, so far to injure him, that at last he has no other course but to sue for peace. Has Russia to dread this? The Russian mercantile marine consist of about 2,500 ships in round numbers and of these scarcely more than a fifth are suited for ocean commerce. The injury would be insignificant which would be done her by cutting off these ships from trade on the open sea, and by blocking them in fortified harbours.

The ocean commerce of Russia is mainly confined to the export of indigenous products, and the import of foreign manufactures. With the latter, which are purely the requirements of luxury, Russia can entirely dispense, or at least she can obtain them by land transport through the adjoining countries at a slightly increased cost of carriage. The natural productions of Russia are so far from the sea, and have to be conveyed such a distance by land from the interior that they might be taken at almost the same expense to a neutral port, such as Memel, Königsberg, Danzig, as to their own harbours such as Riga and Odessa. Russia thus is only a loser as regards the transmission of goods by sea carriage, her products could still find a general market, notwithstanding war with England, and the inconvenience she would thereby suffer would be in this respect of so trifling a nature that it would not force her to make peace.

In conclusion, whoever commands the sea can disturb the coasts of the enemy, and can destroy the seaport towns, so far as they come within range of his guns. This advantage, however, is of very little consequence, since at those points where Russia can really be damaged, that is to say where important towns are situated on her coast, extensive fortifications and batteries armed with heavy guns have already been erected. Torpedoes have also been laid down to hinder the approach of a fleet. Probably the English navy, on account of the great cost of its ships, would suffer more damage than it would inflict, were it to venture on such enterprises; thus here again there are no effective means of bringing about peace.

We have now come to the end of the efficacy of the fleet, and if England depends on it alone she cannot hope to carry out successfully a war with Russia. It is therefore all the more necessary for her to solve the problem by means of her army.

War is an inexorable accountant; she grants victory to those whose armies are best commanded, who possess the best armies and can bring the largest number of fighting men on the field of battle. As regards the manner in which armies are commanded, war itself can alone decide, it may, however, be remarked that hitherto the Russian forces have not been so led as to justify England in counting on a superiority in this respect. Also the quality of troops can only be tested when they are tried. English troops are certainly good, but whether they are better than the Russians the future alone can decide.

It is only on the number of the troops that are available for a campaign that one can previously base any calculations. England has

at present of her own troops an army corps of about 35,000 men ready to take the field, likewise a second will in any case be ready before war is declared. But by this the English army is exhausted ; it has only the militia to fall back upon, and this force is defective as regards training, and can only be employed in a foreign war, for which it is not enrolled, by means of volunteers, who would barely suffice, considering the rapid losses caused by war, to keep up the regular army of 70,000 to its full strength. The fact that these 70,000 men must first be embarked and conveyed on board ship whither they are wanted, is of course a difficulty which at least requires time and costs money.

As England herself can only be attacked by sea, and as in consequence of her maritime superiority she will never have occasion to dread such an attack, at least from Russia, she has plenty of time, and, from her wealth, sufficient money, this difficulty will cause her no inconvenience ; 70,000 men, however, even in alliance with a still stronger Turkish army, would not suffice to occasion the Russians serious apprehensions. The Muscovite forces, which are already quartered in Turkey ought to be amply sufficient to dispose of such an enemy.

But, in addition to her own troops, England has in India a second equally good and far more numerous army, which in peace numbers 300,000 men, and which in war could be easily increased to a large extent by enlistment from the enormous amount of material which is there at her disposal. A detachment of this army, about 12,000 men, is already shipped, other similar detachments can follow. But although England has in Europe unbounded resources for the conveyance of troops, she has none in India, and in addition the sea-transport is longer and costlier, hence, in the course of the first year of the war, England could scarcely count on more than two, or at the most three, of such detachments being available.

There are, moreover, exceptional difficulties to be overcome so as to render these forces available. England possesses in Europe no land except the British Isles where these troops could be collected so that they might be at once made use of on the outbreak of hostilities. Of course one pre-supposes that Turkey will at once join England as soon as war is declared. But the opening of the war will not depend on England, still less on Turkey, but on Russia, who will at once declare it as soon as the first army corps is embarked in England in order to be conveyed to the seat of war in the Mediterranean. At least four weeks must elapse between the embarkation and the arrival of this force, and those four weeks will be utilized by Russia to make herself mistress of the remainder of Turkey in Europe.

England has only got her fleet in the sea of Marmora ; the force now at Malta, which numbers about 10,000 men, and at most the first detachment of the Indian army, which is already on the way there, are ready to join the Turkish army and to oppose the Russians, and probably five days would elapse after the outbreak of hostilities before these 20,000

men would be in position. Turkey has now about Constantinople and the Dardanelles, at the most, 90,000 men, but Russia has 130,000 within two marches from Constantinople and one march from Gallipoli ; thus the matter would be decided and, probably, a great part of the Turkish army would be destroyed before a single English soldier had appeared on the scene. England, in that case, would be compelled to disembark her forces in Asia, perhaps at Smyrna, and thence would have to make her first attack on the Russian army, if in Europe, under the disadvantages of having to cross a broad strait, if in Asia, of having to make a long and wearisome march from whatever point on the coast may be selected to commence, through a thinly inhabited district with but few habitations. In truth the task which England must undertake in a difficult one, and the whole strength of her army, at the most 140,000 men, would not suffice to carry it out successfully.

Russia also possesses a fleet, but this would have little chance with England in a contest for the dominion of the seas. It cannot, however, be said on that account that Russia would derive no advantage from its navy in a war with England ; even were the Muscovite ships condemned to inactivity, the greater part of their crews, officers, and sailors, would be otherwise available. Also, it cannot be supposed that the long time which England requires to arm itself for war would be wasted by Russia. It is the privilege of all nations during peace to build and to arm men of war for other nations, and North America, England's rival on the ocean, would be only too glad to avail herself of this right. Russian naval officers in sufficient numbers, and perhaps also a small amount of Russian sailors, may even now be at the places where Russia has ordered men of war. England has in almost every war made use of levies raised in foreign states, possibly Russia also would be able to enroll among the bold and intelligent seafaring population of the United States enough volunteers to fill up the crews of these vessels, which would not be privateers, but cruisers of the Russian navy.

As soon as war is declared, these swift and well-armed small vessels will at once commence to prey on the English mercantile marine. England has about 26,000 merchant vessels, which cover every sea, but which cannot be protected on every sea and in every place, even by so powerful a navy as that of England. Should then Russia commission only twenty of such cruisers and should these twenty ships not be all captured or destroyed by English men-of-war within a year's time in fights which cannot always be avoided, far more damage would be done to the commerce and prosperity of England than would be inflicted on Russia by a year's blockade of her coasts. England has great reason to dread this sort of naval warfare, Russia has none, and although the former is rich enough to bear such loss, nevertheless, she would either be forced to avoid war or to make peace. For the successful conduct of the war Russia can only depend on her army.

Let us now consider this army. Russia has introduced universal military service, and by that means it is possible for her, out of a po-

pulation of 70 millions in round numbers, to place in the field about a million combatants, and should the war last many years to keep it up at this strength notwithstanding all losses. Besides, Russia is such an enormous, such an extended, but at the same time such a thoroughly compact state, and her frontiers are so disposed that but small forces are required for their protection. In point of fact, the greater part of her frontiers in Asia both by land and sea are partly inaccessible and partly bordered by such insignificant rivals that 100,000 men, or, to express it more plainly the troops that in any case must be maintained to equalise the burden on the resources of the inhabitants, would amply suffice to protect Siberia. It has been shown above that 150,000 men would be enough to secure the safety of the European coasts, hence 750,000 men are left available to carry on the war. Of this number 300,000 men are already in European Turkey, half on each side of the Balkhans and there are 150,000 men in Asia in the trans-Caucasian provinces, 300,000 men are thus fully available to be directed where they are required. In point of fact, there are at least five entire army corps of the Russian army of the line, which as yet have taken no part in the war, and Russia is therefore fully in a position to meet all eventualities which a war with England may call forth, and has still sufficient forces left to carry out independent operations.

In all probability Turkey will be the next theatre of war and considering the forces that Russia has already there on the spot, it is improbable that she will suffer any decisive reverses. Even should an English army of 140,000 men at the very outside be brought into the field the antagonists of Russia will not equal her own troops in number. Turkey is exhausted from the heroic resistance, which, left to herself, she made against her powerful adversary, and what remains of her forces are almost entirely new levies, who, imbued with national fanaticism, will fight bravely, but are wholly devoid of the training necessary for war; in addition, the resources of Turkey are not great, and the best of these have already been consumed. At the present time, there are 90,000 men about Constantinople, 25,000 in Thessaly to repress the Greek insurrection, about an equal number of good and seasoned troops in Schumla and Varna and about 40,000 men in Asia Minor, and Armenia. Even supposing it came about that these troops were united to the English army, there would then be only 320,000 in line opposed to 450,000 Russians, and while every reinforcement of the Turkish army would only consist of raw levies Russia could counterbalance such a force by a similar number of trained and regular soldiers.

In conclusion, even were Russia forced to evacuate the whole of Turkey, she would not be forced to make peace, as long as war did not extend to herself. And this would never occur in a Turkish war, so long as England and Turkey alone were opposed to her, although the successful invasion of her country by another great state might perhaps bring about this result. However, even were this improbable event to occur, Russia would still have sufficient forces at her disposal to

carry on the contest, and the necessity or otherwise of her having to make peace, would depend entirely on the measure of her success.

It may be said, on the other hand, that England also could not be compelled to make peace by the course of a war in Turkey. Even still more than Russia is England protected from hostile invasion by means of her insular position, and by the superiority of her fleet, and so long as the war was confined to Turkey, each adversary would continue to renew the contest until the strength of one or the other was exhausted.

To carry on this kind of warfare, England relies on her wealth, on her wide-spread commerce, and hope during the contest to develop new resources. Russia prides herself on her numerous and valiant inhabitants, all of whom would undertake a war with England, as being forced on them without any justification, with the same glad self-sacrifice, and the same enthusiasm as distinguished them in the campaign of 1812.

Both these elements are sufficient to protract a war for many years, and, in truth, we may see in the future a renewal of the old and tedious contest between Rome, with its universal military service, and Carthage, rich and powerful through its commerce, carrying on its wars on land with professional armies. Carthage endeavoured to bring this war to an end by invading Roman territory, and, as a leader of its mercenary armies, recruited from brave and warlike nations, it possessed Hannibal, one of the greatest generals of ancient times. The mercenary armies of England will also fight bravely, and even if they have a second Hannibal to lead them, and if they penetrate as far into Russia as the Carthaginian Hannibal did into Italy, even still less will they compel Russia to make peace, than Hannibal compelled Rome.

But Rome forced her enemy to sue for peace, not by her victories in Italy over Hannibal, as she did not win any, but by attacking and wresting from Carthage the country which was the principal source of her wealth, the principal recruiting ground for her mercenary armies, namely, Spain. By the conquest of this country, Rome cut the principal artery which nourished the power of Carthage, and prepared for the end of the war, so that it could neither be long postponed, nor could it be doubtful as to result. If Russia can do likewise, so will she likewise conquer her adversary, and force him to sue for peace.

Even still more than Spain was for Carthage is India for England the source of her wealth, and has at all times inexhaustible streams, which can provide fresh hordes of soldiers to fill up the ranks of her armies who are fighting in Turkey.

India is garrisoned by a numerous and well-trained army, and is bounded by mountains which are almost the highest, the most rugged, and most impassable in the world. The valleys of these mountains

are inhabited by comparatively poor but warlike races, enthusiastic for their own independence, while the solitary point where the Russian possessions touch is fifty German miles distant, and these possessions are themselves separated from Russia proper by far-stretching inhospitable steppes. How then can there be any serious danger for India? As a fact, India can be seriously threatened, and were there any prospect of losing her, England, would be forced to make peace at any price; and as this is the case, Russia is bound, under all circumstances to make the attempt.

What forces, then, are available to endanger the English possession of India? To answer this question we must look to India herself.

India proper, so far as comprises the East Indies or Hindostan, has about 170,000,000 inhabitants who belong to very different races. By far the greater number, almost two-thirds, come from ancient inhabitants, and all profess the Brahmin religion. In the northern portion of the East Indian peninsular, from the Deccan they are the least intermingled with other races, but, in the wide and fertile district of the Ganges, they form the principal portion of the inhabitants.

Next to them as regards numbers, almost a fourth of the entire population, come the Mahommedans, who entered the country as conquerors about the tenth century; they are partly of Persian-Affghau extraction, partly Mongolian, who date from the founding of the Empire of the great Mogul by Babur, in 1515. Of these Mahommedans, only a portion acknowledge the Sinnitic doctrine, and recognize the Sultan at Constantinople as their supreme spiritual leader; the greater portion are Schittites, who have the same creed as the Persians, and are more disposed to be hostile to the Sultan than friendly.

Another portion of the population, namely, those in the north and north-east, profess the Budhan religion; and on Upper Indus are established the sect of the Sikhs, whose faith is nearest approaching to a mixture between the religion of Buddha, and that of Mahomet.

Both these sects are as regards numbers unimportant when compared with the remainder of the inhabitants, as in round numbers they are only about from 12,000,000 to 15,000,000; they are, however, warlike in disposition, and have interests different from those of the greater part of the inhabitants of India.

As a rule the native chiefs who are tributary to England, rule over Brahmins alone, and only a few and unimportant personages among the Schittites conquerors have maintained themselves; those who remained and were moderately powerful, were overthrown in the insurrection of 1852*, which they specially set on foot.

* This is given by the writer as the date of the Mutiny; it is one of his many inaccuracies and mis-statements.—*Tr.*

About 60,000 Englishmen reside in the East Indies, and the English regular army there is only 40,000 strong. That so small a number as this can exercise sovereignty over such an enormous majority as 170,000,000 of people, is the best evidence of how wisely and successfully the English Government is carried on. In fact, never at any time, so far as history gives us knowledge, has India been so well governed as by the English. Nevertheless, notwithstanding this good Government, they have been unable to suppress either in the original inhabitants, or in the later conquerors of the country, the longing after national independence, which is constantly being encouraged by the national peculiarities of Englishmen, who remain Englishmen to the end, and seem to lose all power to mix with other nationalities, or to adapt themselves to their customs, even when they have improved and elevated them. Thus they remain foreign and continually opposed to their dependents over whom they rule, and the behaviour of even the most humble Englishman towards the most distinguished native is always of such a kind that the latter must see in the former his lord and master, in fact, a being of far greater importance. On this account the Government of India, although the best of all previous governments, is thoroughly unpopular, and is detested by the devoted adherents of the Brahmin religion, and by the Schittites who follow Mahomet.

Besides the 60,000 native Englishmen who carry on the Government in India, and the 40,000 English soldiers, who are its principal support, there is also the native army, about 300,000 strong, enlisted in India to serve the British Government. Relying on her excellent system of ruling, England at first enlisted this army from all classes of natives, but having learnt from the mutiny of 1852, the unreliable character of such troops, since that time she has enrolled those who profess Buddhist religion, Goorkhas, a race still independent, but extremely brave and warlike, who inhabit the Himalayan Mountains, the equally warlike Sikhs, and the Sinnite Mahomedans, so that at present this army is almost entirely composed of such materials, the remainder of the inhabitants standing aloof from it.

In addition to this army there are also others in the pay of native princes, which, as regards armament and training are almost equal to that in British pay, and have all the special characteristics and composition of the English army of former days ; as regards numbers they are about as strong as half the British Indian army.

At the present time England is in quiet possession of Hindostan, but there are only too many signs that if a power of equal rank were to show itself in that country, and were to attack England, writing on its colours national independence, a conflagration would break out, which the entire strength of Great Britain would scarcely suffice to extinguish. As a sign of the times, the English Government has already forbidden the importation of arms and war material, in order to prevent the native princes from still further extending these warlike preparations, which are already sufficiently formidable to cause uneasiness, and even the

few newspapers which are published in India, contrary to all English customs, are placed under strict censorship. England is fully aware of the danger that threatens her, will face it energetically, and hopes in any case to be in a position to encounter it victoriously at the furthest limit of her empire. This furthest limit is the territory of the upper Indus. How strong an army, then, could England collect there? It is impossible to answer this question exactly, but from similar conditions in former wars, one may rightly infer that it would be impracticable to leave the remainder of India entirely unoccupied. Military forces must be available throughout the whole country, in order that the Government may be secured and carried on. From this, one may conclude that, however small a force may be required during such a war to observe the contingents of most of the native princes (and such a force will certainly be needed) it would be difficult to have more than a third of the army ready in that most remote corner of the wide-spreading Indian Empire to take part in the commencement of the campaign. Should Russia attempt an invasion of India, we must conclude at the very outset she would have to encounter an army of at least 100,000 men. Would it then be possible to collect sufficient forces for this, and would they be able to unite after crossing the barrier of fifty miles (sic) which separates them, and then to deliver an effective attack.

Russia has, step by step, been approaching India, and now possesses the whole valley of Syr Daria, the Araxes of the ancients. She also has the greater part of the watershed of the Amu Darji, formerly the Oxus. Similarly Khiva, Bokhara, and Balk are either partially or entirely subject to her rule. The upper watersheds, namely, those about Samarcand, Taschkand, Bokhara, and Balk, if not exceedingly rich, are at least fertile, and are suitable for the rendezvous of an army intended for an advance in the direction of Hindostan. These were the districts where Timour collected his enormous armies; it was from here that his grandson, Babur, set out to conquer Hindostan. There is at least one railway which comes direct from the heart of Russia into the territory of the Ural. Probably it already has reached Orenburgh; for the space of a year it has been finished as far as Uralsk. From Uralsk the Syr Daria can be reached in a four weeks' march, at the outside. It is true that this march would have to be made through the inhospitable steppes of the Kirgises, where it is a difficult matter to support large bodies of troops. But Russia can take her time, and if every week only two small detachments of from three to five thousand men could be despatched on this road, from four to six weeks would suffice to collect a considerable army, which, as it would have at least four weeks more to march as far as Samarcand, would be ready for departure in the course of four months.

In addition to this route, she has also another which she can utilize to collect her troops, namely, that which leads through the Caspian Sea to Astrabad, and thence by the fertile valley of Attrek direct on Herat; by this alone large bodies of troops could march without diffi-

culty. This route, however, for the most part, passes through Persian territory, and is not available for Russia, unless Persia is her ally; should, however, this be conceded, from 40,000 to 50,000 men might proceed by it in a compact body.

Thus these two routes would suffice, as soon as an attack on India was determined on, to concentrate within four months, an army which had been despatched from the centre of Russia, and of this about two-thirds would be posted about Samarcand, and one-third above Balk. But, in addition, Russia has already in these parts an army of which certainly a portion is available, so that at the end of this time, sufficient forces might be ready to begin the intended attack.

The road which must be followed is pointed out by nature, it leads from the sources of the Amu Daria, up the Hindu Kush mountains by Herat, thence to Cabul, and along the course of the Cabul river to the Indus, and thence to the neighbourhood of Peshawur. As, however, lofty mountains have to be traversed, the route by Cabul is the most convenient, but there are yet others available, which might be utilized to reach the Valley of the Indus. In any case these mountains must be crossed, and the descent into the Valley of the Indus is a problem hard to solve. The feeding of the troops, moreover, would be a matter of difficulty, but perfectly possible. Water can always be procured, and forage for the horses is found in sufficient quantity in the far-stretching and moist meadows which abound on plateaux of the mountains, between Herat and Cabul. As regards feeding the troops, in these days large armies can march without trouble or incumbrance, *thanks to compressed provisions*, through districts where formerly they would have died of hunger. *A single camel can carry provision for 1,000 men, and a rough wagon, capable of bearing only 10 hundred-weight, enough for 2,000 for one day.* This route by Herat and Cabul is the great public road, which all the conquerors of India used in former days. Alexander, Seleucius, and Nadir Shah burst in here from Persia and Oshingischan, Timur and Baber followed direct from the Oxus the road which the Russians must now take. The armies of all these conquerors were by no means less numerous than that which the Russians must now bring up to fight the English in India. What was possible then is certainly practicable now.

All these warriors had possession of the high mountain ranges, between Herat and Cabul, either from conquest or as forming part of their dominions. At the present time these lands are ruled by independent princes, who are supported by the warlike Turcoman and Affghan races broken forth from Persia, and have defeated all the efforts of the English to obtain a footing on these most important passes. The needy inhabitants of these mountains, at war with all their neighbours, gaze with longing on the rich plains beneath them, namely, India, but the severe and determined punishment which the strong and watchful English Government has invariably inflicted after every plundering raid, has for years past confined them to their mountains,

and has forced them to preserve, at least outwardly, a friendly attitude towards the rulers of Hindostan. To the northwards, towards Balk, the mountaineers have no inducement to descend for plunder and conquest, partly because these valleys are not rich enough to tempt them, and partly because they are inhabited by relative or friendly tribes of the same race. If Russia makes war in India she must be sufficiently clever to turn these circumstances to her advantage, so as not only to obtain a free and unimpeded passage for her army, but also she must conclude an alliance with the chiefs and tribes that inhabit the mountains, and thereby she will obtain an addition to her forces which is not to be despised. In the decisive pitched battles which will take place in the plains these reinforcements would be of little use, but before and just in front of the main army, as it issues forth into the enemy's country, they would conceal the main advance, they might occupy and detain at various points considerable portions of the defender's army, which otherwise would be available to oppose the main body. The tribes round Herat and Cabul, if they joined the Russian Expeditionary Army in a body, could easily put 100,000 men in the field, and if these were well directed they would suffice to neutralize from 20,000 to 30,000 men of the enemy.

But has not Russia by far seeing preparations already made dispositions to facilitate an Indian expedition? Since the close of the past winter, movements of troops might have been commenced, and who could detect them? Who would chance to see a couple of thousand men in the far east every week marching eastwards, while a whole army corps marches to the west? and who would attach importance to this, who would consider himself bound to report these unimportant marches, which are common in peace time? But General von Kaufman, the hero of past years, who brought Samarcand, Taschkend, Bokhara, and Balk under the Russian sceptre, has, it is well known, succeeded, by means of the kindly and sociable character of his bold Cossacks, in winning and in retaining the sympathy of those whom he conquered. He knows all the conditions and peculiarities of these countries in the most detailed and perfect manner, and for some time past he has been in attendance on the emperor at St. Petersburg; Generals Gourko and Skobelev are likewise to return with the Grand Duke Nicholas. Surely at the present time, when there is a prospect of the war in Turkey being renewed, these generals would not be withdrawn from the army without an object. But both of these are the bold crossers of the Balkans, whose heights they have scaled and traversed with their troops, partly without roads, partly by almost impracticable mountain paths in the middle of winter, working their way through snow as high as houses. Those who have accomplished their object in spite of such difficulties, will certainly be able to cross the upper ranges of the Himalayas in summer. Perhaps both of these men may be intended for another enterprise, they may be selected to lead an army to India. The enterprise is possible, and should it be carried out, then with anxious expectation would the whole of India await the first collision between

the hostile armies. Should the Russians be defeated in their first battle then they would take refuge in the nearest mountains, where the English, warned by bitter experience in former years, could scarcely follow them, and there the invaders could obtain reinforcements and organize their armies for a second attack. Should, however, the Russians prove victorious in the first combat or in the one that followed it, the whole of India would rise, and it would require the entire power of England to repress this insurrection.

In that case the English would have to leave the Turks to their fate, just as Hanibal left the friendly Samnites, and as he set sail from Italy for Africa with his entire army to protect Carthage, [which was menaced, so would the English be obliged to quit Turkey with all their forces and to direct them on India. Thus an English and Russian war would be brought to an abrupt conclusion and would be fought out in India. But the distance is great, and the embarkation of a great army, even if England should have an unlimited number of ships at her disposal, requires time, and thus it might easily happen that this army when it reaches Bombay, the nearest Indian port, might find before it the Russian army joined with those of the native Indian princes, and who can tell, with any certainty, whether the English would be more fortunate in the battle which will then take place on the slopes of the Galtee mountains, between Poona and Bombay, than Hanibal was at Zama. In any case, then, the war between Russia and England will not be fought out in Europe but in distant India.

III.

ON CARLIST TRENCHES,

BY

CAPTAIN B. H. BARRINGTON KENNET,

51st K. O. Light Infantry.

The great similarity of the country, in which we are now at war, with that, in which the Carlists made so good a fight for their "Fueros" led to the idea of this paper being written.

During a visit to the North of Spain, when the struggle was taking place, I had an opportunity of inspecting the Carlist Trenches, and I was much struck by the points in their favour.

The comparison made is therefore between the usual mode of entrenching in a mountainous country, and that used by the Carlists. Fig. 1.

The Sketch is intended to represent a soldier firing from the side of a mountainous position towards an enemy approaching his post.

The shaded portion of the mountain side is loose earth, excavated to form a trench, and thrown up to make a sort of parapet.

Fig. 2 is intended to represent a soldier firing from the side of a mountainous position towards an enemy approaching his post, but the trench is clean cut and the earth instead of being used to make a parapet as in Fig. 1, has been taken away to some distance.

A. B. C. D. represent shells falling near trench Fig. 1.

A' B' C' D' represent corresponding shells falling near trench Fig. 2.

A in Fig. 1 is dangerous as it would throw up the loose earth and stones into the faces of the defenders.

A' in Fig. 2 is harmless—it falls on the solid earth, and any stones &c. would go over the heads of the defenders, who would get under cover on seeing it coming.

Suppose shell A in Fig. 1 to have exploded in the loose earth outside the ordinary trench, the fragments might easily strike the defenders—especially if the earth had been much knocked about.

In the Carlist Trench it would be impossible for fragments of shell A' in Fig. 2 to strike defenders as they would go over their heads.

Again, after a heavy concentrated fire at Fig. 1 the parapet of loose earth might be almost levelled, leaving the defenders entirely exposed, whereas in Fig. 2 no amount of firing could affect the solid earth in the vicinity of the trench.

Shell B falling in Fig. 1 would certainly damage a greater number of men than the corresponding shell B' in Fig. 2 owing to the greater width of the ordinary trench.

For the same reason more shells would fall into it.

Shell C in Fig. 1 would be decidedly dangerous as the backs of the defenders would be exposed, and the same may be said of D.

Corresponding shells C' and D' in Fig. 2 would be quite harmless.

There are of course objections to the Carlist Trench ; for instance it takes much labour, and the removing of the earth excavated, to some little distance greatly increases the time taken for the work.

Another objection to the Carlist Trench is that when once taken it affords protection to the enemy.

This last objection can be obviated by the system of enfilading trenches shown in the diagram.

X Y and Z represent three trenches cut on the side of a hill X being the lowest.

Should X be taken the defenders retire to Y whence they can enfilade X.

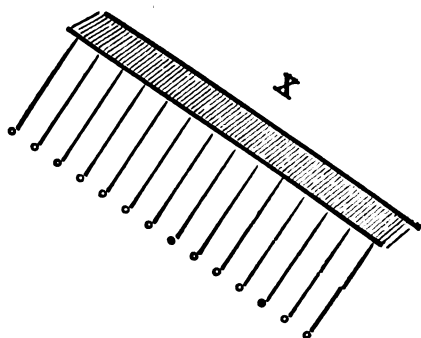
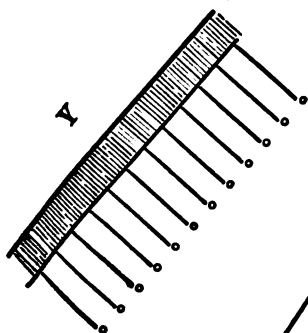
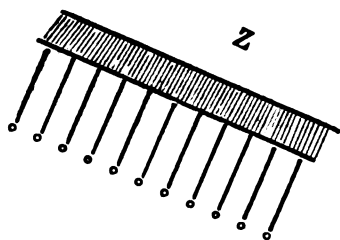
Should Y be taken, defenders can retire to Z whence they can enfilade Y, and then X is too far from Z to be of any use to the enemy.

The parapet of loose earth in Fig. 1, forms a decided mark for the enemy, it also is easy for the enemy to observe when it is hit by the cloud of dust raised, and thus to obtain the exact range.

On the other hand in the Carlist Trench it is difficult for the enemy to observe whether their shells have hit close by or many yards away from the trench, as in both instances the shell explodes on solid ground.

If the positions of the Carlist Trenches are carefully chosen it is almost impossible for an enemy to observe their whereabouts.

In some instances the Carlist trenches were connected by a covered way.



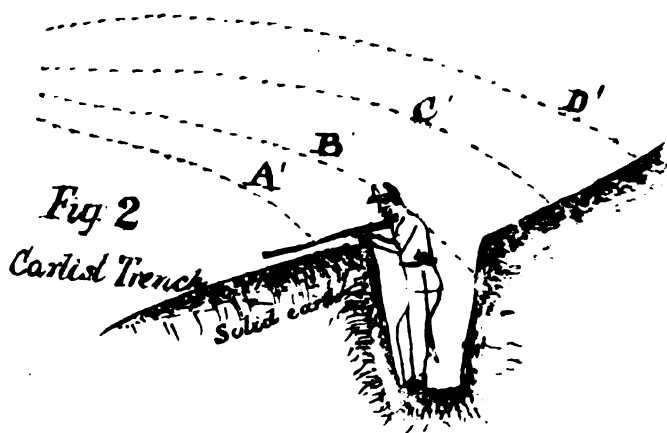
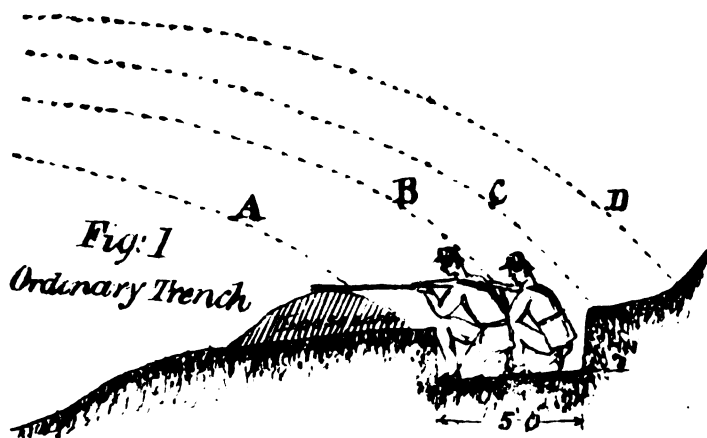
It may reasonably be presumed, that in very many instances trenches are cut a long time before they are required, and so in these instances the objections to the Carlist trench on the score of want of time, and amount of labour required, do not hold good.

It seems evident that this extra time, and labour would be as nothing compared with the additional amount of protection afforded to the defenders using the Carlist trenches.

Camp,
Ali Musjid,
Khyber Pass.
January 12th 1879.

B. H. BARRINGTON KENNETT

Captain 51st Light Infantry.



IV.

A RESERVE FOR THE NATIVE ARMY.

BY CAPTAIN H. S. ANDERSON

12th "Kelat-i-Ghilzie" Regiment.

The peace strength of a Native Infantry Regiment being 600 Sepoys, and the lowest war strength being 800 Sepoys, I propose in this paper to consider how the Native Army could be best brought up to a war footing, and with the shortest notice.

The present system is as follows.

When a regiment is ordered on service, a certain number of other Regiments are called on for volunteers, to make up the number required, these regiments recruiting up to peace strength as quickly as possible.

This system is slow, and could not be carried out, in the event of a war breaking out, when a number of regiments would be required for immediate service, for many regiments would have to be reduced to mere skeletons to supply the number of men required for, say 20 Regiments.

To obviate this I would propose that each regiment should have a reserve of 200 men raised as follows.

Every year a certain number of first rate well trained soldiers of from 2 to 9 years service apply for their discharge chiefly for reasons connected with land, and temporary difficulties at their homes, these men are a great loss to regiments, but a man having served 3 years can claim his discharge, under certain circumstances, from this cause alone regiments lose from 10 to 20 of their best men yearly.

I do not believe there would be a single man among these, who would not be willing and glad to enter into an agreement to serve for two months in every year for training, and to rejoin the colors in time of war, if certain inducements were held out to him.

As these reserves could not be expected to join their regiments every year, I would suggest that officers commanding regiments, should be given a list of stations, where it is considered advisable that the reserves should assemble yearly for training, and allowing them to name 4 or 5 stations which would be most suitable to the requirements of their regiments, stating at the same time how many of the 200 men, they would propose to allot to each station chosen.

These numbers, after being once fixed should not be altered, except, on reference to His Excellency the Commander-in-Chief.

In the event of too many men being allotted to one station, a little re-arrangement might be necessary, but I do not think very much would be required.

I should fix 300 men as the outside number to attach to one Regiment, I do not think this would in any case be exceeded.

The time for assembling the reserves would vary, according to the climate, so as to choose the times when a man is least required at his home for agricultural purposes.

This scheme could not be carried out hurriedly but by degrees, and if the men are chosen with care, a body of men trained and accustomed to drill and discipline, could be added to the Native Army on an emergency at 6 or 7 days notice.

As soon as the numbers are fixed for each station, arms and accoutrements would be indented for to the number allotted, these would have to be kept clean for 10 months in the year by regiments, for this duty, I should propose that a certain sum (to be fixed hereafter) should be allowed per hundred stand of arms—this would allow of a small amount of staff pay being given to those told off to keep them clean.

A certain course of drill might be laid down, which should be deviated from as little as possible. This might be something as follows, supposing there are 9 weeks for drill. I would allot the time as follows :—

- 1st Week ; without arms, marching in squads and squad drill generally.
- 2nd Week ; the same with arms, manual and firing exercises to be taught.
- 3rd Week ; manual, firing and Bayonet exercises to be taught, marching in larger squads and in two ranks.
- 4th Week ; company drill.
- 5th 6th and 7th Weeks ; Battalion drill and Skirmishing.
- 8th Week ; outpost duty.
- 9th Week ; collective and field firing.

A certain amount of staff pay would have to be allowed per 100 men trained annually, from which the staff employed to drill the reserves might be paid, the amount need not be large.

The regimental camp equipage might be made use of for housing the men.

When the full number of reserves from each regiment is procured there would be from 60 regiments, 12,000 men, who within seven days could be collected, armed, and clothed, ready to join their regiments wherever required.

For clothing, I would have a Khakee Jumper with khakee or blue knickerbockers made of American drill, dyed. A puggree of the Regimental color, and Hindustani shoes—I would make an allowance for the repair and renewal of clothing, as a part of the man's pay, which he would forfeit if the clothing was not in good condition, this will be noticed when I come to the pay of the reserves.

I have said nothing about the Non-Commissioned ranks in the reserves, because I am of opinion that the reserves should only consist of Sepoys.

The inducements I should offer to men to join the reserves would be as follows.

Pay at Rupees 2 per month, Rs. 6 to be paid on assembly for training, Rs. 6 on 1st of 2nd month, and Rs. 12 on dismissal.

I would also allow Rupees 2 annually, to every man who brought up his clothing and boots in good order, those whose clothing were not in good order, to buy at their own expense any articles required.

Unless a man appeared for training, he would receive no pay, and unless he brought forward some very good reason he should be discharged summarily.

The cost of keeping up this large reserve would not be much, the pay would come to 312,000 per annum for 12,000 men, then there would be something extra for drill instructors, and cleaning of arms and accoutrements.

I have not included in the inducements to join, that of service in the reserve counting in any way towards pension, as I am of opinion that although such a boon would increase the popularity of the scheme, still it is not absolutely necessary, as I am of opinion that the numbers would be very easily procured without such a boon. Some limit should be put to the length of service in the reserve, this I should propose to be as follows.

A man should serve not less than 4 years with his regiment, he might then if he wished it, and there was a vacancy be transferred to the reserve, to serve for a period of not less than 5 years, after completion of which he might re-engage for another 5 years, with the reserve, if physically fit for active service.

A man should at any time be liable to discharge from the reserve, for misconduct during training, or physical unfitness for active service.

In conclusion, it will be no doubt argued, that this scheme throws a great deal of extra work on the officers of those regiments to whom the reserves are attached, this is true, the work would be increased very largely, but I think might be overcome by granting Rs. 100 a month staff pay to one of the Subalterns of the Regiment, for officiating as adjutant of the reserves, and either appointing an extra Subaltern officer to those regiments, or else taking a subaltern officer from those regiments, which have no reserves attached to them, and attaching them to the regiments which have reserves, for the two months training.

I am of opinion that the whole cost of training and paying these 12,000 reserves would not exceed, by much, 400,000 rupees annually.

A reserve of arms and accoutrements would have to be kept up in Arsenals, and they would be kept in just as good order under regimental supervision, so that no addition need be made in the expense in that line.

I would allow a man transferred to the reserve a free pass by railway or river steamer to the station of assembly from the Headquarters of his Regiment.

On arrival at the Station of assembly, he should report his arrival to the officer Commanding the Regiment, on which he is to depend for his training who will enter him in the reserve roll book, with date of transfer, and his address from the Regimental descriptive return.

I am of opinion that this system of reserves would materially assist regiments in procuring recruits. Say 30 recruits are required for a regiment, the Commanding officer instead of having to send large recruiting parties need only send two men, the reserve men collecting and sending the recruits into the station to be examined.

I should make the punishment for a man not joining when called out for war, very heavy, such as loss of land, transportation, &c.,

A man should be allowed to leave his village when not required for training, by simply writing into the Head-quarter Station stating the place he is going to, and the probable duration of his absence.

Leave except under very special circumstances, should not be granted during the months of training.

H. S. ANDERSON, CAPTAIN.

V.

MILITARY OPERATIONS IN AFFGHANISTAN,

BY

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BHAWALPORE.

After, for twelve years, stigmatizing as Russo-phobists all who doubted the expediency of permitting Russia to advance to any point she pleased as "joint Arbitress of Asia"—the English Press has now turned round.

When the exponents of public opinion commence to advocate an armed occupation of Candahar and Herat, it is not too soon for military men to discuss the *modus operandi*. I have myself no views to offer as to the political expediency or otherwise of such a step. I simply look at the matter professionally, and propose to examine how offensive operations can best be carried on in Affghanistan, if the army is at any time ordered to undertake them.

Considerations on this subject naturally divide themselves into several heads as follows :—

Objects of the operations.

Choice of a theatre of operations.

Comparison of lines of operation.

Description of the theatre.

The Military situation.

Plans of operation.

Transport and supply.

Mode of occupation best suited to the object of the operations.

(1.) *Objects of the operations.*

A. The object sought in advancing into Affghanistan would probably be to secure the main routes between Hindostan, Persia and Turkistan.

B. It would be desired to effect this at the least cost, and with the least extension of territory possible ; and, therefore, that the operations

should be rapid and decisive, and limited to the complete attainment of the first object.

C. Consequently it must be sought to crush promptly all organized resistance, and to avoid exciting a guerilla war,—thus permitting of the early reduction of the army of occupation to the lowest possible strength.

(2) *Choice of a theatre of operations.*

The only route between India and Turkistan which traverses Eastern Affghanistan is perfectly impracticable, for modern armies, for 130 miles between the Helmund and Ghorbund valleys and the head of the Khulum river. Much time and labor would be required to render this a practicable military route, and it may therefore be left out of consideration.

Thus the only communications between Hindostan and the north and west (disregarding Belochistan) pass through western Affghanistan. The roads to Persia and Turkistan by Seistan and Herat, and those to Eastern Affghanistan and Hindostan by Katawaz, Ghuzni, Cabul and Quetta, all meet at Candahar, and are there compressed into a narrow space between the desert on the south and the mountains of Hazaristan on the north.

Thus the occupation of western Affghanistan affords what is stated as the first object.

It also affords the second desideratum,—for the experience of 1839-42 shews that Affghanistan may be occupied and held with moderate forces, even when that occupation included the difficult country of Eastern Affghanistan, inhabited by turbulent and warlike tribes. Western Affghanistan, therefore, of a much easier physical character, and occupied by less formidable races, could be garrisoned with a very small strength, when organized opposition had once been quelled.

It only remains, then, to consider whether the last object is best sought by a move on Western Affghanistan, or whether it is advisable in the first place, to strike at the capital.

The experience of 1865-68 shews that Cabul is by no means, such a political and strategical centre that its occupation will paralyze resistance and end a war at a blow. On the contrary, Western Affghanistan would still remain to be over-run. On the other hand Cabul is more difficult of access than Candahar, and also to move therefrom on Candahar is less easy than from our own territory. Moreover operations in Eastern Affghanistan would probably involve us in a guerilla warfare with the Ghiljis and others.

Thus, if military advantages and facilities can be shewn to exist in operations on western Affghanistan, there is no object to be gained in

operating on the eastern side to outweigh these in regard of the third disideratum.—

(3). *Lines of operation compared.*

For operations against Affghanistan the general British base is the line of frontier from Karachi to Peshawar. The Affghan base is primarily, Cabul—Candahar, and, in the second place, Balkh—Herat.

Four lines of operations are open to us.

On Cabul	{ 1 By the Khaiber 170 m.	} Distances from the British Frontier.
	{ 2 By the Khurrum 170 m.	
On Candahar.	{ 3 By Kutawaz 360 m.	
	{ 4 By Quetta 340 m.	

No. (1) traverses difficult passes for 30 miles between Peshawar and Jellalabad and for forty miles between Jellalabad and Cabul.

Jellalabad, 90 miles from Peshawar, is a considerable town, situated, in a fertile valley, and affording a convenient place for Magazines; Tezin and Dhaka also afford supplies; but on the whole it may be said that this route, in addition to its great physical difficulties, presents that of a lack of forage and supplies.—

On No. (2) 54 miles of difficult ranges intervene between the Khurrum Valley leading from our frontier and that of Logur which conducts to Cabul. This route is subject to the same objections as No. (1) but in a less degree.

No (3) traverses 70 miles of gorges and mountain passes before debouching into the chain of open valleys leading to Candahar or Ghuzni. Supplies and forage lack utterly in the first 70 miles, but afterwards the latter is available.—

No. (4) passes for 200 miles through the territory of our ally the Khan of Khelat. It crosses for 110 miles over the plain of Gundava, through which a line of Railway has been surveyed. It then traverses the Bolan pass for 60 miles. A pass sufficiently easy, but destitute of forage and supplies and then enters the open country in which is situated our advanced post of Quetta. Up to Quetta this route may be regarded as within our frontier, and thus the line of operations No. (4) may be reckoned as commencing at this point. From Quetta the route reaches Candahar in 140 miles through an open and fairly cultivated country, traversing but one serious obstacle, the Khojeh Amrán range which, at Khojak, is crossed in a day by three passes all easily susceptible of improvement.

Thus Candahar as an objective has the following advantages;—

1. Comparative shortness and easiness of line of approach.
2. Open and fairly fertile districts for the support of the army.

3. Strategic importance as holding the debouchure of the only military roads between Eastern and Western Afghanistan.

It follows that Western Afghanistan should be selected as the theatre of operations, and that Candahar should be taken as the objective.

(4.) *Description of the theatre of operations.*

The boundaries of this theatre are;—

On the north, the Hazaristan.

On the east, the Khojeh Amrán range.

On the south, the Desert.

On the west, the Persian frontier.—

This space is traversed from N. E. to S. W. by the Helmund and its great feeders the Turnuk and the Argandab,—which latter unite near Candahar, and fall into the Helmund about 40 miles below Girishk, a fort 70 miles west of Candahar.

The Helmund terminates in the swamps of Seistan, as do the Kash, Farrah and Herat rivers running parallel to the Helmund across the Candahar—Herat roads at 80 miles, 150 miles and 200 miles, respectively, to the west of it.—

These rivers are all unbridged, but, being generally fordable everywhere (save in April and May), they cannot be regarded as obstacles of importance.*

The country is otherwise open and easily traversable, but save on the main routes, water is difficult to procure, and forage is scanty everywhere during the winter. Supplies for troops must be provided from depôts but these can always be filled from the local markets by systematic arrangements, as there is no lack of population, cultivation and flocks and herds in western Afghanistan.

The valley of the Turnuk, running North East from Candahar, is followed by the great route to Ghuzni and Cabul, skirting the Gulkok range—which is separated from the Hazaristan to its west by the parallel valley of the Argandab. The latter valley is also followed by a route which enters it from Mookur (the place where the Turnuk rises.) This debouches on to the Herat road about 10 miles west of Candahar, and there is no communication west of it between Herat and Cabul, save by impracticable mountain routes across the Hazaristan.

Three routes from Candahar to Herat† separate at Girishk on the Helmund cross the Kash at different points, and meet at Subzawar‡ on the Harut—both the southern-most passing by the town of Farah.§

* The Helmund is often difficult to ford, and a ferry is maintained at Girishk.

† 360 miles by the shortest route.

‡ 280 miles from Candahar by the shortest route.—

§ 230 miles from Candahar by the shortest route.

From Girishk also a route follows the Helmund to Seistan and Lash Jowain,* whence it rejoins the Herat route at Farrah or at Subzawar, along the Farah or Harut rivers. The southernmost of the routes to Farah also branches from Kash, down the river of that name joining the Seistan route at Lash.†

The strategic points in this theatre are Candahar, Girishk, Farah, and Mookur, on the Turnuk, Helmund and Farah rivers; and the two first named rivers are strategic lines of a certain importance.

(5) *The military situation.*

The British base for operations in the above theatre is, primarily the line of the Indus and Chenab, and of the railway, from Kurrachi to Multan :—secondarily, Quetta. The objective is Candahar and the line of operations selected is the route from Quetta to that city.—

It may be assumed that, with proper precautions in the matter of pretended concentrations, and collection of supplies and carriage, at Peshawar and Kohat,‡ a force of 15,000 men could be concentrated, at Jacobábád before the Amir could commence to push troops upon Candahár.

The situation, then, on any given date (say 1st January 1889) might be supposed to be approximately as follows :—

British.

At and in advance of Jacoba- bád§ and Dadur.¶	} 15,000
At Quetta||	
En-route to Jacobabad from Bombay and the Punjab as reserves and for the communications.	} 10,000

Magazines completed at Shikarpur and in course of establishment at Dadur and Quetta.

Affghanistan (rough estimate.)

At Candahar, and towards Quetta.	{ Regulars	14,000
	{ Irregulars	8,000
	{ Guns	60

* 300 miles from Candahar by this route.

† 250 miles from Candahar by this route.

‡ Where they could be retained for the event of an advance from Candahar on Cabul; or the supplies could be passed down to the true base by river.—

§ 340 miles from Candahár.

¶ 230 miles from Candahár.

|| 140 miles from Candahár.

At Cabul and towards Peshawar, Kohat and Candahar.	{ Regulars	18,000
	{ Irregulars	10,000
	{ Guns	72
In Affghan Turkestan (350 miles from Cabul.)	{ Regulars	8,000
	{ Irregulars	2,000
	{ Guns	36
At Herat and Farah and towards Candahar	{ Regulars	4,000
	{ Irregulars	8,000
	{ Guns	24

N. B. The army which moved on Affghanistan in 1839 was of strength as follows :

Field Forces.	{ British troops	13,000
	{ Shah's contingent under	
	{ British officers.	6,000

On communications, British troops 9,000.

Resides Colonel Wade's force of Shah's and Sikh troops which moved by the Khaiber.

The 30,000 men with whom it is now proposed to operate are immensely superior, no doubt, in equipment and organization to the army of 1839;—but the Affghan forces of the present day are proportionately better than those which were then at Dost Mohamad's disposal. Herat, Candahár and Cabul were then under different rulers, at variance among themselves, whereas the Amir of Cabul is undisputed master of the whole resources of Affghanistan, including Affghan Turkestan which in 1839 was independent.

The Amir once satisfied as to the real line of attack, might be expected to hurry on a concentration at Candahár—a movement which in January would be much retarded, as regards the troops from Cabul and Balkh, by the snow which lies deep about Ghuzni and in the Hindu-Kush. As considerable garrisons would necessarily be retained at Cabul, Balkh and Herat, and as a large proportion of the irregular troops above mentioned consists of tribal contingents many of which would probably hang back to observe the result of the conflict, it may safely be assumed that 45,000 to 50,000 Cavalry and Infantry (two thirds of them regulars), and about 140 guns, would be the utmost that the Amir could put in the field. The first Cabul reinforcements would not probably commence to arrive at Candahár before the beginning of February—nor could the whole of those from Herat and Farah be assembled there before that time.

(6) *Plans of operations.*

The evident object for the British, in the above situation would be to interrupt the Affghan concentration; to interpose between their

wings, to throw their right wing back on the Helmund and to envelop their left in the valley of the Turnuk—divergent lines separated by the Hazaristan ; and thus to destroy their forces in detail.

Should this object for any reason not be attainable, should the Affghans be able to concentrate the gross of their forces undisturbed, then the alternative plan would be to detach a force to seize the Affghan communications on the Turnuk by the route which branches to Khelat Ghilzi from the Khojeh Amran range. The British forces, then, moving concentrically on Candahár, and afterwards operating constantly by their right, might succeed in throwing back the Affghans upon Seistan and might hem them in there and compel them to surrender or disperse.

On this plan however the Affghan army would be very difficult to grasp, after the first encounters about Candahár. Even if cut off from Cabul it would probably succeed in evasion towards Herat, and if followed there, could retire through Affghan Turkestan to the capital thus possibly necessitating a move on the latter point before the campaign could be brought to a close.

If, on the contrary, the Amir's troops were separated from the first, and their concentrating detachments attacked and scattered in detail, then organized resistance would be speedily disposed of, and protracted operations thus averted. Evidently therefore, if this is possible, it is the proper course to adopt.

If the first troops arriving at Jacobabad were promptly pushed on to Quetta,* the force there might be completed to 10,000 men, and might be ready to move within about a week of the completion of the concentration on the Indus, say by the 10th January at the latest. The first column might thus reach Candahár by the 20th December, or a day or two later. By this time the head of the second column should be approaching the passes of the Khojeh Amran range, held meanwhile by detachments from the advanced column in entrenched positions.

Some 9,000 British troops would thus be in face of only 20,000 Affghans, if these stood at Candahar. Manœuvring by the right to seize the Cabul road we should easily throw them back on the route to Girishk, and then, leaving 2,000 men in Candahar, the first column should follow up and take position on the right bank of the Argandab, to prevent the Affghans from regaining their communications by the valley of that river and over the Gulkoh range.

If the Candahar garrison fell back, before the arrival of the first column, upon its reinforcements coming from Farah and Herat, the object would be equally gained.

If, however, they fell back up the Turnuk then, the first column should not push them, but await the arrival of reinforcements and the development of the flank movement mentioned below.

* 200 miles.

The second column should reach the Khojeh Amran range by the 20th—24th January. The leading brigade proceeding direct to Candahar would reinforce the garrison of that place to 6,000 men by about the 26th January. Meanwhile the rest of the column should seek, by the route to Mookur* from the Khojeh Amran range (a distance of about 200 miles,) to envelop the detachments moving on Candahar from eastern Affghanistan.

The advanced guard of this column should debouch at Mookur by the 9th or 10th February at the latest, by which date most of the Cabul troops would have passed that point.

The position would then be as follows :—

(1). *British* centre (6,000) at Candahar, with wings (6,000 and 5,000) at Mookur and in the Argandab respectively,† the latter closing upon Candahar.

Affghan left (about 15,000) between Mookur and Candahar ; right (about 28,000) between the Helmund and the Argandab. Or—

(2) *British* left (leaving a garrison (1,000) in Candahar) about Khelat Ghilji (11,000) closing on Mookur. *British* right 5,000 in position at Mookur.‡

Affghan main body (about 35,000) between Mookur and Khelat Ghilji ; *Affghan* troops from Herat and Farah (8,000) on the Argandab.

In either case the *Affghan* troops between Mookur and Candahar would be entirely dispersed. In the first case this would be only the *Affghan* left, and the *British* centre and left would then be free to operate towards the left of the *Affghan* right wing in their front, with the view of throwing it off its line of retreat and anticipating it at Farah, while the right following on the Helmund, aided in hemming it into Seistan. This done the operations would be concluded, no further organized forces remaining to overthrow.—

In this view, immediately upon success in throwing back the *Affghan* right upon the Helmund in January, measures would be taken for amassing supplies upon the Argandab ready to push forward on Girishk§ for establishment of magazines as soon as that place was seized.

In the second case, of course, operations would be virtually over when the *British* wings met at Mookur, the bulk of the organized forces having been crushed at a blow.

* 160 miles from Candahar.

† Deducting detachments, sick, wounded &c.,

‡ 70 miles from Khelat Ghilji.—

§ 70 miles from Candahar.

Thus the preferable plan of operations is one which, surprising the Affghans in the act of concentration, either separates *them* into two bodies which are enveloped successively or else cuts the main body off from its reinforcements and hems it into a defile from which there is no escape save by dispersion.

This plan however requires a promptness and celerity of movement and an accuracy of combination only possible under certain assumptions and conditions which will be detailed when I speak of transport and supplies.

It is therefore necessary to consider the other contingency of the Affghan Army's completing its concentration at Candahar, and, if defeated there, falling back as an organized body, instead of being destroyed or routed beyond possibility of rallying.

In this case the Affghans might either,

(1) Retreat on Cabul, or—

(2) If cut off from Cabul by the turning movement by Khelat Ghilji before proposed for this contingency—fall back towards Herat for Affghan Turkestan.

In the first case it would probably be considered advisable to move on Cabul.

In this case it would be preferable to confine operations to the single line from Candahar; for the angular base confers no advantage, the Affghan line of retreat being beyond the point of junction of concentric operations. Were such adopted moreover, from the nature of the intervening country each would be entirely isolated. Accepting this as sufficient reason for operating on a single line, that from Candahar is certainly the one to adopt, though it is 316 miles in length against 190 miles by either the Khaiber or the Khurram routes. For it is an easy line, presenting no physical difficulties and affording forage and a certain amount of supplies—and also, the British Forces being already massed thereon, it would be inconvenient to assemble another sufficient army at Peshawur or Kohat.

Advancing on this line, the immediate British base would be the city and district of Candahar. The supporting force of 10,000 men, after filling up the gaps in the Field Force, would hold Quetta, Khojak, Candahar and Khelat Ghilzi, and would furnish escorts for convoys. As the army advanced beyond Mookur, communications would be opened, successively, with Kohat by Ghazni, and with Peshawar; and these lines would be guarded by troops from those garrisons.

The route from Candahar presents the advantage of dividing north of Ghuzni,* and thus affording two lines of advance,†—the direct one debouching upon the road leading from Cabul to Bamian and Balkh,‡ and that on the east proceeding by the valley of the Logur upon Cabul itself. Moreover from Ghuzni a mountain route diverges, leading into the Bamian road in the valley of the Helmund.—

The force would not, probably, leave Candahár till the middle of March, as the snow does not melt about Ghuzni till that time, and forage would not be available there till later.—

This would give leisure for the establishment of Magazines at Khelat Ghilji.§ from which point the army 20,000 strong,¶ could reach Cabul in 16-18 days. Arriving at Ghuzni, about the end of March, 2,000 men would be left to besiege that fortress, which is commanded by the adjacent hills and would fall in a week. A light column 4,000 strong would be detached into the Helmund Valley. The main force in two columns would move on Cabul,|| by the direct and Logar routes supposing these operations to have pushed off the Affghans from their lines of retreat west of the Ghorbund valley, then the left column would reinforce the detached force on the Helmund, by the Unai pass, and enable it to push on over the ridge between the sources of the Helmund and Ghorbund, with the view of heading the Amir's Army, or, at any rate, of cutting it off from all but the eastern—most passes leading to Kunduz, which cannot be traversed till the month of June.—If however, on reaching Maidan (24 miles west of Cabul), the left column of the main force found that the Affghans had evaded the stroke and passed that point to the westward, it would still reinforce the detached force, by the Unai pass, to enable it to act with effect on the enemy's rear.

If these operations succeeded the Affghan Army would be compelled to surrender or disperse by the main columns following upon its rear. Even, if by prompt retreat the Affghans gained the western passes leading from the Kohistan they would be found, at that season (April), so impracticable that the fragments of the army would reach Turkestan entirely disabled. If they succeeded in evading the enveloping movement altogether, nevertheless the detached force would certainly reach and hang upon their retreat in the valley of the Helmund, and up that of Karzar, and would bring them to ruin in the passes which lead out of that valley.

It cannot be disguised that the operations here discussed are arduous. In the supposed event of our failing to cut off the Affghan

* 230 miles from Candahar.—

† In 52 miles and 70 miles respectively from the fork at Hyderkhel.—

‡ 350 miles from Cabul.—

§ 90 miles from Candahar.

¶ Casualties, and sick and wounded left at Candahar, or sent to the rear, being made up from the reserve.

|| 86 miles from Ghuzni.—

Army from Cabul, and—even if successful in bringing it to action—only defeating it without ruining it, we should have to move against the capital in force. Even after losses in battle, and defections of irregular contingents consequent on defeat, it is probable that the Amir would be able to collect there, at least 30,000 regulars and 10,000 to 15,000 irregulars with 80 to 100 guns.

The only object in moving upon the capital would be to render this force 'hors de combat,' to which end it would be necessary to move rapidly and to seize the Affghan lines of retreat. Thus the Field force must be strong enough to detach a flanking force towards the Hindu Kush, and another to mask Ghuzni, while leaving a main body of sufficient strength to ensure victory before Cabul. A strength of 20,000 is the least that will suffice for this, and, as will be seen under the next head considered, it is a difficult matter to move so large a force so great a distance, with the rapidity and accuracy of combination necessary to the object.

It yet remains to consider the case of our succeeding in cutting off from Cabul the Affghan forces concentrated at Candahar. This would be effected by the concentric movement of the main British force from the Khojeh Amran range and of a turning wing detached to Khelat Ghilji in the valley of the Turnuk. The latter would have about 200 miles to cover while the main body had only 80 miles. They could notwithstanding move simultaneously; as the detached force would certainly debouch, and take up a position at Khelat Ghilji, before the Affghans could reach that point, if they fell back before the British main body. Thus they would, in this case, be enveloped, having lost their line of retreat on the Helmund. On the other hand if they stood fast, either from confidence or to secure the line just mentioned, the main body could wait on the Turnuk, east of Candahar, while the detached force, after opening communication with it, attempted, by one of the low passes over the Gulkoh range, to debouch on the Affghan line of retreat by the Argandáb.

If the Affghans evaded these combinations, and secured their retreat to the Helmund, the probability is that they would at any rate be brought to action first and greatly shattered; or, if not at Candahar, at any rate before they reached Girishk. In this case it might be possible to head them with a light column at Farah and to hem them into Seistan. The probability however is that difficulties of supply would prevent any effective combinations beyond the Helmund, and that the utmost we could do would be to follow up with a light column to Herat. We might push them there into the Hindu Kush, so far discomfited and disabled that the distance of 720 miles between that place and Cabul, lying as it mostly does through stupendous mountain ranges, would complete their ruin as an organized force.

In the case just considered, therefore, it would not be found necessary probably to move on Cabul.

To recapitulate:—

There are three possible modes of operation ;—

(1) By prompt concentration and rapid combinations to surprise the Affghans while still scattered, and either to roll up and surround the bulk of their detachments in the valley of the Helmund, or to envelop and destroy their wings in succession.

(2) By a flanking movement to envelop the concentrated Affghan Army, or at any rate to throw it back upon Herat after disabling it by severe defeats.—

(3) Failing (2), to follow up the Affghan Army upon Cabul, and there seek to envelop it, to throw it on to impracticable passes of the Hindu Kush, or at any rate to disable it before it could escape towards Balkh.—

In the first and second cases the necessity of an advance upon Cabul would be avoided, and it would suffice to hold western Afghanistan in the manner hereafter detailed. The first plan depends upon certain conditions of transport and supply, of which I will now speak.

(7) Transport and supply :—

The first of the plans of operation detailed under the last head depends upon two assumptions.

(1) That operations can be commenced early in the winter of the year in which they are determined on, viz. by the 1st January at the latest.

(2) That the Amir can be amused and kept in doubt as to the line of attack while preparations on our base are completed. The object being that his concentration may commence late and be retarded by snow—also that the season may enable our troops to dispense with tents.

The plan further depends for success on celerity of movement, for which the following conditions are necessary :—

(1) That the troops, European and Native shall march without tents—except for Field and General Hospital purposes—the camp equipage following to Candahar by the end of February, by which date the sun there becomes powerful.

(2) That all small arm ammunition, of the Regimental and both Divisional reserves, shall be carried on mules ; and that of the third reserve on camels. Also that a train of 3,000 mules* and 3,000 camels

* Including Pakal mules.

be purchased for this purpose; the Regimental reserve and Pakal mules being made over to the Regiments, and the camels and mules of the other reserves being organized in Trains, the drivers of which shall be enlisted, armed, and kept under military discipline.

(4) That baggage shall be limited to the scale fixed for the Jawaki expedition, camels being substituted for mules without diminution of rate, so as to permit of more comforts being carried on a longer operation.

This, with the Hospital train, for the carriage of tents, Hospital necessities, and of sick men, will require about 5,000 camels for the Force of 20,000 men. These, as well as the camels of the small arm ammunition reserve, should belong to the Government, and should be organized in one Train, say 10,000 camels in all, allowing for casualties.

(5) That camp followers shall be limited, as nearly as possible, to the scale of the Jawaki expedition: 10,000 camp followers should be the utmost allowed for the force of 20,000 men, including the drivers of the mule and camel trains and the men with the 12,000 camels of the commissariat supply trains.

(6) That three day's ration of biscuits, or cooked bread, shall always be carried by the troops, to be completed daily from the supply trains accompanying the columns. Also that flocks of sheep and goats shall be provided to follow the columns for daily supply of meat. These, are obtainable in quantities all over Belochistan, are easily driven and managed, and can thrive on the scanty forage that will be found along the routes of operation.

(7) That forage shall be stored by the Khelât authorities, at all stages up to Quetta, by the date of the concentration, so that the horses and baggage cattle may reach that point without losing condition, and that the Commissariat may have to carry forage beyond Quetta only. Also that, after the first column has passed on, forage shall be similarly stored up to the Khojeh Amrán range, and a depot of supplies at once established in the Khojak fort.

(8) That the Commissariat supply trains with the columns shall carry none but absolute requisites for the troops, including bhoosa and grain for the horses and other cattle,—no liquor or other luxuries being allowed.

With depôts formed beforehand at Dadur and Quetta, and, after the first column had passed that point, at Khojak, the furthest troops would never be more than 200 miles from their supplies;* from Khojak, therefore a train of 5000 camels would suffice to carry supplies including forage for the detached column of 5000 men.

4000 supply and forage camels would accompany the march of the first column from Quetta to Candahar and 2000 camels would carry

* Mookur 200 miles from Khojak and 160 miles from Candahar.—

the food supplies of the second column from Jacobabad to Dadur, and replenishing there, and again at Quetta, on to Khojak; whence they would carry on both food supplies and forage for the 6,000 men marching on Candahar. Say 12,000 camels for the supply trains accompanying the troops from point to point, and 12,000 more for the convoys to replenish the depôts. These with 10,000 camels of the Military Trains make up 34,000 (or with casualties say 40,000*) camels which would be required for these operations, besides 3,000 to 4,000 mules and yaboos for the Field Force of 20,000 men.

This does not include bullock carts for tents, nor the carriage of the 10,000 men in support, for whom carts and pack bullocks would in a great measure suffice. The carriage of the artillery reserves, parks &c., is not of course, included.

(8) *Mode of occupation :—*

Supposing that it were decided to hold Western Affganistan on the defensive, the following arrangements would probably suffice ;—

At Candahar and Khelat Ghilji, a Brigade of all arms ...	5,000
At Farah, a Brigade of all arms	3,000
At Herat, a Brigade of all arms	3,000
At Quetta, Infantry and Artillery	2,000

At Khushk Killa Nao	} Hazareh and Eimâk Levies 6,000.
Obeh	
Subzawâr	
Sakhir	
Darawat	

At Khojak	} Belooch Levies 2,000.
Lash Jowain	

In this manner the main strategic points will be held by British troops, with outposts of irregulars on the main lines of approach and on the communications. In ten day's time 6,000 regulars and 5,000 levies could be concentrated at Herat, or 7,000 regulars and 3,000 levies at Candahar.

If, however, Western Affganistan were occupied with consent, after a *decisive* campaign, the Brigade above detailed for Herat might be dispensed with—Farah detaching some infantry and artillery to hold the citadel there; and that at Candahar might be diminished by 2,000 men, Khelat Ghilji not being held. The Levies might also be reduced to half the numbers specified, performing merely the police duties of the province.

* That number was easily collected for the Army of the Indus, and 33,000 casualties were replaced besides. Moreover the Powindeh herds of camels (some 30,000) arrive on the Derajat frontier in October, and, 10,000 animals of a class peculiarly suited to the work, could be purchased out of these, for the military trains.

But if Western Affghanistan could be occupied with consent, much more could Hazaristan or the mass of mountain ranges between it and Cabul, and between both and Affghán Turkestan. For this tract is inhabited by races hostile to and barely subjected by the Affghans, and it gives the Amirs of Cabul much trouble and little revenue.

If this tract could be obtained it not only affords the means of rendering the North Western Frontier perfectly impregnable, save on the side of Persia, but it so completely envelops and neutralizes Eastern Affghanistan as to render the political sympathies of the Affghans or their rulers a matter of indifference to us.

The rest of Affghanistan being well known it was needless to go into details regarding it, the Hazaristan, however, is less familiar to most; I therefore throw together in a concise form all the information that exists regarding it.

(1) The great range of the Hindu Kush, which shelters Affghanistan proper from Chitral to Herat, is known as the Koh Baba, west of the 68th degree of east longitude, where the Hazaristan commences. A degree and a half west of that point, this main range divides into three, the Tirbund of Turkestan to the north, the Sufed Koh in the centre, and the Siah Koh in the south. East of the 68th degree the Hindu Kush, stretches eastward, getting higher and higher and more and more impracticable till it joins the great table-land of the Pamir, in longitude 73 degrees. West of longitude 68 degrees, *i.e.*, in the Hazaristan, the mountains are traversable at many points; but the Hindu Kush itself can only be crossed by special passes. Between longitude 68 and 70 degrees, the country to the north of the range, is partly included in the Hazaristan and partly in the district of Kunduz, subject to the Government of Afghan Turkestan. South of the range there is the district of Kohistan, and the communications between the two are by three main routes each of which have several alternative passes, by which the actual ridge of the mountain is crossed. These are, from the east, the Punjsher, Perwan and Ghorbund routes—being the valley of the rivers of those names, which all eventually unite and fall into the Cabul river. These passes are practicable only during five months of the year to laden animals, on account of the snow. There are no particular physical difficulties during those five months on the principal passes, which are all used by horsemen and laden camels, and have been traversed by Central Asian armies with artillery. At the same time they may safely be left out of consideration among the routes available to an European force.

(2) East of longitude 70 degrees are two or three passes, leading from the country of the Siahposh Kafirs into Badakshan, of which nothing is known, as no traffic can pass through the savage Kafirs. East of these are the following passes between Chitral and Badakshan:—Durra, Kharteza, Nuksan, Agrâm, Sateshterak, Peerkhar—of which only the first and last are even practicable for horsemen and laden

animals, and which are all consequently out of the question for military operations.

Evidently, then, the right flank of the Hazaristan is quite secure and needs no attention. If in safe hands, it would also be perfectly impenetrable in the centre, as will be seen from what follows.

(3) The routes leading through the Hazaristan between Afghan Turkestan and Afghanistan are as follows:—

1. The great route between Khulm and Cabul, *via* Bamean.
2. The route from Balkh to Candahar by the Balkh river.
3. The route from Maimunna to Herat.

Besides the alternative and branch routes pertaining to each of these main routes, there are also cross routes through the mountains, practicable only for horsemen, and of which no notice need here be taken. All will be referred to when the statistics of the Hazaristan are given in detail. The routes here given are those used by traffic and by Central Asian armies; they have all been traversed by artillery. Nevertheless, when the best of them, that by Bamean and Khulm, was examined and reported upon by a British officer in 1839, with a special view to moving troops thereby, he pronounced even the main line impracticable without great labour on the construction of the road to render it passable by artillery, which must even then be drawn over the passes by hand, as no labour could render them practicable for horse draught. A good deal was then done to improve the portion of the route between Cabul and Bamean, but since our evacuation of Cabul the road has deteriorated into its former condition. One branch of route No. 3, crossing the western extremity of the Hazaristan, was recently traversed by Mr. Vambéry; a second, in 1845, by General Ferrier; and a third, in 1839, by Major Pottinger. The description of all shows that they are impracticable in their present condition for European troops, and that they would require considerable labour to render them traversable; and subsequent native accounts show this to be the case at the present day. The central route (No. 2) has not been surveyed, nor reported upon by any European officer, but native accounts describe it as inferior to the other two.

(4) Thus the line of operations against Herat would be limited to those through Persia and Merv, and the possession of the line of the Oxus above Charjoe and of Afghan Turkestan, would be evidently of no account to Russia, as no line of communications could be maintained across the front of the Hazaristan. But occupation of the Hazaristan would equally render unavailable to an enemy the line of the Moorghab river and its feeder, the Khushk, which is the usual route from Merv to Herat. No such line could be used in the face of a force holding the Hazaristan, because the last six marches up the Khushk valley, through the districts of Badkhez, traverse the very difficult country of the Jemshidis, on the left flank of Hazaristan, and cross the continua-

tion of the Safed Koh—(the Central branch, as before mentioned, of the three into which the Koh Baba divides between longitude 66° and 67°)—called at that point the Koh Kytoo.

Thus an army moving against Afghanistan would be compelled to limit itself to that one route which follows the Heri river, and all converging lines of operations—whether from the Oxus by Merv or from the Caspian by the Etrek river or from Astrabad through Khorassan—would have eventually to fall into that one road.

(5) The tract of country known as the Hazaristan may be described as extending east and west from the Koushan pass over the Hindu-Kush range (one of those on the Ghorbund route before mentioned) to Marchah on the Turkoman frontier, and north and south from Sirpool, one of the Uzbeg Khanates subordinate to the Afghan Government of Turkestan, to the neighbourhood of Girishk, between Candahar and Herat. It is divided between two kindred races, descendants of military settlers left by the Tartar hordes that swept over Central Asia under Cheaghiz Khan and his descendants. These are the Hazarehs, inhabiting the eastern portion of the Hazaristan, and the Eimâks located in the west. The latter are generally of the Sunni persuasion, but include a section of Shiah; the former are Shiah Mohammedans, though comprising a Sunni tribe. The two branches separated in the time of the Nadir Shah, or early in the eighteenth century. The country occupied by the Hazarehs varies from 5,000 to 12,000 feet in height; it is cold, rugged and barren, but supports innumerable flocks and herds, and abounds in mineral wealth. The Eimâks inhabit a more hospitable region, interspersed, it is true, with lofty ranges, but abounding in pleasant valleys and pastures. Both Eimâks and Hazarehs have lost their original language and adopted that of the aborigines of the hills in which they are settled (the Tajiks)—an ancient dialect of the Persian.

The original divisions of the Eimâks (who are known as the "Four Eimâks") are as follows; Taimunnees, Hazarehs, Soorees, Taimurees. Of these the two last may be excluded from consideration in an account of the Hazaristan. The Taimurees, who can muster some 4,000 horse-men, are now entirely in Persia, inhabiting settlements on both sides of the Herat-Meshid road. They were carried off bodily about 1835 by the Persian Governor of Khorassan, and located there to hold in check the Turkomans. To them have been subsequently added, in 1875, some thousand also of the Hazareh Eimâks, who now inhabit Kareez and Shahr-Nao, and the debatable ground between these and the Herat border. The existence of the Soorees as a tribe has been destroyed by the Taimunnees, who have occupied their territories, and among whom they now live in scattered families to the number of some 5,000 or about 25,000 souls in all.

(6) The four Eimâks then, are now reckoned as follows: (1), Taimunnees; (2), Hazareh Firozekohi; (3), Hazareh Zeidnat; (4) Hazareh Jamshedi—Nos. 2 and 4 being originally sections of No. 3—

adopted thereinto from amongst its Persian neighbours. The Ferozekohis are the descendants of a number of broken Persian tribes transported into these mountains by Timoor Lang, after a desperate resistance, from the neighbourhood of Firozekoh in Mazendran. The Jamshedis are descendants of a tribe from Seistan, and it is not known how they came into the Hazaristan. The total Eimāk population in the Hazaristan amounts to between 350,000 and 400,000 souls, inhabiting a country 150 miles in length by an average breadth of nearly the same. They are all nominally subject to Herat, but pay little revenue (and that in kind), and render only occasional military service. Their country contains the upper courses of the Murghab, Farah, Harut, and Khāsh rivers, and of a great feeder of the Helmund, and is traversed also by the Heri river. It is thus amply supplied with water and only requires settled government and the construction of roads and canals to develop enormously in population and production. The extent of arable soil is large, and great facilities exist for irrigation. In the sheltered valleys orchards of all kinds of fruit trees abound. The mineral riches of the country are stated to be great, and there is no doubt that copper, lead, iron, and sulphur, are plentiful in many localities. The Eimāks are essentially nomad and pastoral. The chief places mentioned are merely camps. They live principally in tents, encamping in winter in the valleys, and in summer on the table lands of the mountain ranges. They are ignorant, hospitable, and brave, and ardent followers of the chase. Their principal trade is with Herat, and consists in woollen and camel-hair fabrics and clarified butter, which are bartered for necessities. They are, as are the Hazarehs, intensely hostile to the Afghans, but disunion, as in the *case of* those kindred tribes, prevents their being able to resist them.

The following notices give all the information that at present exists regarding the Eimāk tribes.

(7) The Taimunnis inhabit the Siahbund, which is the district comprised between the Siah Koh range upon the north, the upper course of the Farah river on the west, the chain of hills stretching from Farah towards Girishk on the south, and, on the east, a great feeder of the Helmund, called in the official map the river of Killa Moossa. This is a tract comparatively level and fairly fertile. It is watered by feeders of the Farah, Kash and Killa Moossa rivers. The extensive plains, interspersed among the hills which intersect the tracts, afford pasture to vast herds of cattle, horses and camels, and might easily be cultivated with the aid of irrigation from the rivers. The principal districts are:—On the north, Jevej, chief place Shehrek; on the east, Daria Dura, chief places Zamān and Sungān; on the west, Taideh, chief places Taideh and Chardeh; on the south, Taivereh, chief place Taivereh, Sakhir, and Zerni (the ancient Ghor). The Soorees, before mentioned as a broken Eimāk tribe, are principally located in the west of the district of Taideh, about the head waters of the Farah river. Some of them also reside in Zerni. The total population of these districts, including Soorees, is from 120,000 to 150,000 souls, and they can turn

out, by a *levée en masse*, some 4,000 horsemen and 10,000 footmen. The Taimunnee country is traversed by two routes from Herat to Candahar, the northern by Taidch and Zerni, the southern by Sakhir and Taivereh. On both routes there is ample water forage and fuel, and the country can supply camels and horses in large numbers for carriage, and horned cattle and sheep for the commissariat. Other supplies are not procurable, as the production of grain is only sufficient for the consumption of the natives. These routes are little used, both as being insecure and as crossing a more rugged country than the regular route by Farah and Girishk, which is easy, though circuitous. The tribe pays a small tribute in kind to the Government of Herat, and renders military service in case of war.

(8) North of the Taimunnees in the upper portion of the valley of the Heri river, between the Siab Koh and Sufed Koh ranges, and among the valleys which are traversed by the feeders of the Moorghab, live the Firozkohi section of Hazareh Eimâks. Their southern boundary is the Siakhkoh, on the north the Tirbund range, on the east the country of the Mongol and Deh Zangi Hazarehs, on the west the district of Herat and that of the Zeidnal Hazareh Eimâks.

The principal districts are :—On the north, Kucheh, chief places Derzi, Ghuzneh; east, Gurjistan, chief place, Robat; west, Kadis, chief place, Muzar; south, Chekcheran, chief places Badgah, Dowlutyar. This tribe has also settlements in valleys of the northern water-shed of the Tirbund range, Khoja Kundoo, Shakh and others.

This tribe is smaller than that of the Taimunnees, the population being under 100,000 souls, but they are renowned for their courage, and can turn out on an emergency some 4,000 horsemen and as many foot. In 1814 the Firozkohis inflicted a signal reverse upon a Persian army that advanced against the districts of Marchah and Punjdeh, on the Moorghab river. (Those districts were then occupied by this tribe, but were subsequently wrested from them by the Zeidnat, and from them again by the Turkomans.) They have also held their own against successive Governors of Herat, to which Government they still render but a nominal allegiance.

The Firozkohi country is traversed by two routes between Herat and Cabul, the northern one proceeding by Muzar Derzi to Ghiganuk, Bamean and Cabul, and the southern by the valley of the Heri river to Dowlutyar, whence routes branch to Bamean and Cabul, Cabul direct, and Ghuzni.

This is the poorest and most mountainous part of the Eimâk country; nevertheless water, forage and fuel are abundant, numerous horses are available for carriage—for the mountain glens afford pasture to great herds of hardy galloways; sheep innumerable graze on all the hills, and one of the above roads, bad as they are, has been traversed very recently by an Afghan force accompanied by light guns. Both roads are

used by merchants, though unfrequently, owing to the predatory habits of the tribes through which they pass.

(9) West of the Ferozkohi live the Hazareh Zaidnat, in the mountainous tract between the Moorgâb river and the Valley of Herat. These are their northern and southern boundaries respectively, and to the east and west lie the districts of the Ferozkohi and Jamshedis. The principal districts are:—On the north-west, Ushareh—chief places, Ushareh and Toursheikh; east, Gulistan—chief place Gulistan; south, Killa Nao—chief place, Killa Nao. This tribe also occupied, till lately, the districts of Punjdeh and Marchah on the Moorghâb river, from which they have now been ousted by the Turkomans. They have also scattered settlements as far east as Karchu, between Sirpul and Kuram. This was once the most important of the Eimâk tribes, both as regards numbers, wealth, and reputation for hardihood and rapine. Successive blows, however, at the hands of the Afghan Governor of Herat in 1847, and of the Persian Governor of Khorassan in 1857, followed by the encroachments of the Turkomans, have greatly weakened the tribe. They still, however, muster about 100,000 souls, and can turn out five thousand formidable horsemen, and as many footmen. They possess in the numerous valleys of the southern feeders of the Moorghâb river admirable and extensive pastures, supporting vast herds of horses and horned cattle. These valleys are susceptible of extensive cultivation by utilising the irrigation of the streams. Their country is traversed by the important route from Herat to Maimunna, which was before referred to, with the alternative route through the Jamshedis, as one of the three main routes crossing the Hazaristan. This route, though more difficult than the alternative one to the west in the Jamshedi country, is more generally used by traffic on account of its being further removed from the dreaded Turkomans. It passes by Killa Nao and Gulistan, and continues, after crossing the Tirbund range at Kara Jungle, by the Ferozkohi Valley of Khoja Kundoo. The remarks made regarding the routes passing through the Ferozkohi country apply also to this route. This tribe pays a small tribute in kind to the Government of Herat, and renders military service in case of war.

(10) The Jamshedis inhabit west of the Zeidnat, and are, like that tribe, contained between the Herat district on the south, and the Moorghâb river on the north. To the west they have the Salor Turkomans. The principal districts are:—On the north-west, Khushk—chief place Khushk; on the east, Moorghâb—chief place Bala Moorghâb; on the south, Sirchushma—chief place Karukh. They have also settlements in the northern valleys of the Tirbund range, Kirta, Takht Khatun, and others.

The Jamshedis are the smallest of the Eimâk tribes, numbering only some 60,000 souls; but they can turn out 6,000 horse, who are the dread of the whole eastern border of the Persian Government of Khorassan. They extend their raids as far south as Scistan, and, with

the connivance of the Zeidnat and Taimuree Eimâks located on the Persian borders, they penetrate as far into Khorassan as Toorsheez.

The Jamshedi country is open and fertile as that of the Taimunnis, but they are unable to cultivate their best lands, in the valley of the Khushk river, by reason of the Turkoman incursions. For the same reason the Badshahi (royal) route from Herat to Maimunna, passing by Khushk, Toursheikh, (of the Zeidnat) and Bala Moorghâb, is almost disused. The route is an easy one, passing through what might be a fertile country; as it is, water, forage and fuel are abundant, and large droves of horses, horned cattle and sheep pasture in the valleys and on the dividing ranges. The Jamshedis pay tribute in kind and render military service to the Government of Herat.

(11) The Hazarehs, occupying a colder and more rugged country than the Eimâks, are naturally a more barbarous and poorer race. For the same reason, valley being cut off from valley by formidable mountain passes, they live more scattered, under petty chiefs, and have less national and tribal unity. For this cause they have always been the prey of their neighbours. The Afghans have ousted them from the low lying and more fertile tracts in their possession. The Uzbeks previous to their subjection to the Afghan Government in 1851, used to carry them off by hundreds into slavery, on the plea of being "Shia," infidels, and to make continual inroads for this purpose into their hills. Their Eimâk cousins, being Sunnis, or the rival Mohammedan sect, used also to make raids upon them in this view, and they were even sold into slavery by each other in the course of their internecine feuds, and sometimes actually by their own chiefs, when called upon to pay tribute to, or desirous of propitiating some powerful Uzbek Chief of Turkestan.

Thus, notwithstanding the possession of a country over 200 miles in length, by an average breadth of nearly 100 miles, their population does not probably even now, notwithstanding the suppression of the slave trade for many years past, by the Afghans, much exceed 400,000 souls. As before mentioned, their country is exceedingly rich in minerals, especially lead and sulphur. Their mountains also afford pasture to countless flocks of sheep, and large herds of horses and horned cattle graze in the valleys. In the more sheltered spots considerable quantities of fruit are grown, but not more grain is raised than is required for the consumption of the inhabitants. Water and fodder abound, but fuel is, in parts, very deficient; a serious matter, as the cold in the winter months is extreme. The country contains the head waters of the Moorghâb, Hari, Helmund, Argandab, Logur, Khulm, and Kunduz rivers, but these upper courses are mere mountain torrents, incapable (save the Helmund and Argandab, in the Jakuri country) of affording irrigation. The people are not nomadic, like the Eimâks, but live very much scattered in small hamlets.

The principal divisions of the Hazarehs are as follows, commencing as in the case of the Eimâks, from the south :—1. Jakuri; Deh Chopan

branch, Deh Pollah branch. 2. Deh Kundi. 3. Deh Zangi; Sirjungle branch, Sugdeh branch. 4. Mongols. 5. Deh Surkh. 6. Foladi. 7. Broken tribes. 8. Shaikh Ali.

The following notices give all the information that at present exists regarding each of the above.

(12) The Jakuri, inhabit the district comprised between the Gulkoh range upon the east, a feeder of the Helmund called the Khud Rud on the west, the Tereen river (a feeder of the Helmund), and the Candahar district on the south, and Bisut of the Foladis, and the Deh Kundi on the north. Their country, by comparison with that inhabited by the other Hazarehs, is flat and fertile. It is watered by the Helmund and its feeder the Khud Rud, and by the Argandab, and is susceptible of high cultivation by utilising their waters for irrigation. As it is, the Jakuris export a certain quantity of grain to Ghuzni, but their chief staples of trade are clarified butter and woollen fabrics, both the produce of the numerous flocks and herds. Their manufactures of the latter are famous. They also export lead, sulphur, and antimony. Their traffic is entirely by barter for cloth and other necessities. The principal districts are :—on the north, Argandab—chief places, Utala, Sang Masha; east, Great Nawur—chief places Nani, Karabagh. N. B. Great Nawur is on the east watershed of the Gulkoh range which separates it from Little Nawur in Argandab. Being level and fertile it has been greatly encroached upon by the Afghans, and is reckoned among the districts belonging to the Government of Ghuzni. West, Gujeristan—chief places, Gujeristan Potu. South Malistan—chief place Chakmak.

The total population of these districts, west of the Gulkoh range, amounts to about 60,000 souls, and can turn out on an emergency some 8,000 ill-armed horse and foot. The tribe has a low military reputation, partly because so broken up into petty sects as to be able to offer but little resistance to the Afghans. The district of Great Nawur pays £10,000 revenue in cash to the Government of Ghuzni. and, as a great portion of the population is now Afghan, it should be excluded from the proposed lease. The division of Malistan pays £2,000 cash revenue to the Government of Candahar and Argandab and Gujeristan pay occasional tribute in kind to the Government of Ghuzni. The entire tribe owes military service to one or other of these Governments. The Jakuri country is traversed by the direct route from Candahar to Balkh, before referred to as crossing the Hazaristan by Deh Kundi and Deh Zangi and the valley of the Balkh river. This route is very direct, and can be traversed by an unencumbered horseman in seven days from Candahar to Balkh. The route before mentioned as running from Herat to Dowletyar, and, branching to Ghuzni, also traverses the Jakuri country by Gujeristan and Little Nawur.

(13) The Deh Kundi inhabit the hills north-west of the Jakuri. They are bounded on the north by the Siah Koh range, on the west by

the Killa Moossa river (falling into the Helmund), on the north-east by the Deh Zangi, and on the south-east and south by the Jakuri. Thus they border on the Firozkohi and Taimunni Eimâks upon the north, north-west and west. They are, however, separated from them by the Siah Koh range and by a great spur which that range throws up to the south. Their districts in the Siah Koh are lofty and barren, but they possess many beautiful valleys nestling in the southern spurs of that range. Shut off from all communication with Afghanistan, neither trader nor tax-gatherer visits them, and they live upon the produce of their flocks and their scanty cultivation, obtaining such trifling articles from the outside world as they absolutely require from the caravans that pass through Bamean, by barter of their felts and carpets. They pay neither revenue nor tribute, and the only allegiance they acknowledge is to the common chief of themselves and the Jakuri, with which tribe they are classed under the general term of Pusht Koh (behind the mountain), as being south of both ranges of the Hindu Kush (Safed Koh and Siah Koh). Their country is traversed by the route from Candahar to Balkh, before mentioned, which, however, though easy and direct, has not yet come into general mercantile use, on account of its insecurity. Though their country abounds in mineral wealth, they are unacquainted with its value; and their sole industry is their scanty cultivation, their sole property their herds of horned cattle and sheep, and droves of hardy mountain horses.

The principal districts of the tribe are—on the north, Sangtakht; on the east, Sheikh Miran; on the west, Hasht Assia; (none of the scattered hamlets of these divisions attain to even the dignity of a village); on the south Meidan—chief place, Meidan. The total population of the above is under 40,000 souls, and the tribe can turn out some 5,000 horsemen.

(14) North-east of the Deh Kundi, and separated from the Jakuri by the south-western districts of Bisut, lie the Deh Zangi. This tribe occupies the northern watershed of the Siah Koh and both watersheds of the Safed Koh,—their settlements being in the valleys of the two great feeders of the Heri river, the Sirjungle and the Lal rivers. They are bounded to the north by the Deh Surkh, to the north-west by the Mongols, to the west by the Firozkohi Eimâks, to the south-west by the Deh Kundi, and to the south and east by Bisut.

Their country is the wildest and most mountainous of all the Hazareh districts, they have little or no cultivation, but their mountains are covered with endless flocks of sheep, and the valleys afford sufficient expanse of pasture for droves of horses and horned cattle. The tribe possesses the highest military reputation of all the Hazarehs, and, till checked by the Afghans, rendered the great Bamean route untraversable by caravans without payment of black mail. They pay an occasional trifling tribute in kind to the Governor of Bamean, but their allegiance to Cabul is of the loosest, and they render no military service. Their country is traversed by the route from Candahar to Balkh, before

mentioned, and also by one of the routes mentioned as running from Herat to Cabul, Bamean and Ghuzni, through the districts of the Firozkohis. This route forks at Dowletyar one branch follows the valley of the Sirjungle stream, and traverses the Deh Surkh country to Bamean; another follows the valley of the Lal stream through Deh Zangi, and goes on to Cabul by Bisut; the third turns south-east through Gujeristan and Little Nawar of the Jakuri and runs to Ghuzni direct.

The principal districts of the tribe are:—On the north, Sir Kol—chief place, Gurghani, on the east, Tagow—chief place, Bor; in the centre, Lal—chief place, Lal; on the west, Sirjungle—chief place, Sirjungle; on the south, Waras—chief place, Paiab. The total population of the above is about 60,000 souls, and they can turn out some 10,000 men by a *levée en masse*. Lead mines abound in these districts, and some traffic is carried on with Bamean in cattle and wool.

(15) North-west of the Deh Zangi lies the country of the Mongols, called also Sehrai, or inhabitants of the desert. They occupy the highlands between the Sufedkoh and the Tirbund of Turkestan, being bounded to the north by Sirpul, to the east by the Deh Surkh and to the south and west by the Firozkohi Eimâks. Their country is traversed by the northern of the routes before mentioned, as running from Herat to Cabul. This route, first traversing the Firozkohi country, then crosses that of the Mongols by Ghanimut to Deb Hissar and Ghiganuk, whence it goes on by the Deh Surkh districts, and Shehr Berber to Bamean. The Mongol districts, though lofty, are comparatively level and fertile, and abound in rich pastures. The tribe is nominally dependent upon Sirpul, but pays no tribute, and has little communication of any kind with the outer world. Their chief wealth is in horses. The principal districts are:—North-east, Cheyras—principal place, Deb Hissar; south-west, Ghanimut—principal place, Ghanimut. The numbers and military strength of this tribe are not even approximately known.

16 East of the Mongols inhabit the Deh Surkh, a kindred tribe to the Deh Zangi, and known, with them, under the generic name of Berberi. Their settlements are on the head waters of the river of Balkh, at the source of which are situated the ruins of the ancient and famous city of Shehr Berber, the seat of the Berber or Mongol dynasty. The whole of the scattered tribes of Hazareh Eimâks are still known in Persia by the name of Berber. The route just mentioned as crossing the Mongol country also passes through that of the Deh Surkh by Shehr Berber to Bamean. And the route before noticed as running from Candahar to Balkh, through the country of the Jakuri, Deh Kundi and Deh Zangi, continues down the river of Balkh by the western districts of the Deh Surkh. The Deh Surkh are bounded on the north by Sirjungle, Deh Zangi, and other scattered Hazarehs dependent on Khulm and Sirpool; on the east by the districts of Bamean; on the

west by the Mongols; and on the south by the Deh Zangi. Their principal districts are, from the east:—Hazrat Ali—chief place Shahr Berber; Yak Oling—chief place, Deh Surkh; Zwaluj—chief place, Zwaluj; Zawunj—chief place, Zawunj—these being successive valleys extending along or debouching on to the course of the river of Balkh.

The numbers of the Deh Surkh amount to about 50,000 souls. Like the Deh Zangi they pay occasional tribute in kind. They have little cultivation and no trade, though their country abounds in minerals. They occasionally barter the produce of their endless flocks and herds for necessities obtained from the traders passing through Bamean.

(17) East of the Deh Zangi lies the country of Bisut, occupied by the various sections of the tribe of Foladi. This district is bounded on the north by Bamean, on the east by Cabul, on the west by Deh Zangi, and on the south by the Jakuri. Though mountainous, it is the most thickly inhabited and best cultivated of all those in possession of the Hazarehs. The Foladi, however, like the Jakuri, have been gradually expelled by the Afghans from many of their most fertile low-lying tracts. Bisut pays about £10,000 cash revenue to Cabul, which, however, as is generally the case with the Hazareh and Eimāk revenue, requires to be collected by armed detachments at considerable expense to the Government. The tribe is of low military repute, though strongest in numbers of all the Hazarehs, having suffered less than any other tribe from the slave trade. The principal districts are:—On the north, Karzar and Ferai Khulm—chief place, Karzar; on the east, Khirja Bad Assiah—chief place, Sir-i-ab; in the centre, Sang Nishandeh—chief place, Koh Baran; on the west, Jergai Barjehgai—chief place, Kerrin on the south, Ghiru Maini—chief place, Ghiru Maini.

Bisut is traversed by the various branches of the great route leading from Cabul to Bamean, and thence by Syghan and Kamard, to Khulm and Balkh. This route, before referred to among the three main routes traversing the Hazaristan, leaves Cabul by the valley of the Cabul river, then crosses the Pass of Unai on to the plains of Yurt and Kheirgu, from which it descends into the valley of the Helmund at Girdun Dewar, and either leaves it directly by the Siah Reg Pass into the valley of Karzar, or follows it up stream to the junction of the Siah Sung stream, which drains the valley of Karzar. Turning up that valley to the north, the route presently leaves it again by the Hajiguk Pass into the parallel valley of Kalu to the west. From Kalu one route proceeds to Bamean direct, by the valley of Mori, and crosses a mountain spur into that of Topchi by the Shuter Girdun or by the Huft Peelan Pass, or avoids both Passes by a long detour west. It then follows the Topchi stream down to its junction—at Ahinghur, four miles east of Bamean—with the river of Bamean, the southern feeder of the river of Kunduz. Thence it turns up the river to Bamean. Another route from Kalu follows the Kalu stream down to its junction with the river of Bamean at Zohak, nine miles east of Bamean, traversing the Pimuri defile. A third route follows the Karzar valley up to its

head, and crosses the Irak Pass into that of Irak. It then follows the Irak stream to its junction with the Bamean river four miles east of Zohak and thirteen miles east of Bamean. This Irak valley also communicates to the east, over a Pass, with that of Ghorbund, between the Hindu Kush and Pugman ranges. The Ghorbund route between Cabul and Turkestan was before mentioned in enumerating the passes of the Hindu Kush.

The Foladi muster above 100,000 souls—some of whom reside in the districts pertaining to Bamean, but the greater number in Bisut. They carry on a considerable trade with Cabul in felts, carpets, wool, clarified butter, sheep, and cattle. Both Foladi and Jakuri swarm in thousands down to Affghanistan and the Punjab during the winter season in search of work, as do, to a less extent, all the other Hazarehs, except the Sheik Ali and the Mongols. They are skilful in earth and stone work; the women labour as well as the men, and even the children help to carry the earth.

(18) Immediately about Bamean, and to the north and north-west, lie various broken tribes of the Hazarehs. The subordinate districts of Bamean—Kalu on the south; Irak and Shibr on the east; Foladi, Sorkhdurra, and Shirbortu, on the west; and Ak Robat on the north—are inhabited partly by Tajiks and partly by Foladi Hazarehs, already included in the strength of that tribe. Banuck and Dusht Sufed, west and east of the valley of Kamurd (north of Syghan,) are inhabited respectively by a section of the Jakuris called Ajuris, and by Mongols. Roi and Kanchu, north and north-west of Doab (the valley north of Kamurd), belong respectively to some Hazarehs called Arabs, and to a branch of the Hazareh-Zeidnat Eimâks. The district of Balkhab, on the river of Balkh, which is subject to the Uzbeg Khanate of Sirpul, is occupied by a section of the Sirjungle branch of the Deh Zangi. The total of these, leaving out the Foladi already reckoned in Bisut, may be estimated at 30,000 souls. The valleys of Bamean, Syghan, Kamurd, and Doab, are themselves inhabited by Tajiks to the number of some 20,000 souls, and are included, equally with the Hazareh valleys in the Hazaristan. Bamean, with its dependent districts, and Syghan, Banuck, Dusht Sufed, and Kamurd, pay a cash revenue of £10,000 per annum to an Affghan Governor yearly deputed there.

These scattered Hazareh districts border upon various routes. The continuation of the great route from Cabul to Bamean and Khulm reaches the valley of Syghan through the district and by the pass of Akrobat. Thence it continues, either direct over the Dundan Shikun pass to the valley of Kamurd, or reaches that valley by the Nal Farash pass and through the Dusht Sufed district to the east, or by the Banuck pass and through the Banuck district to the west. A branch route also leads *vid* Ghorî to Kunduz from the Dusht Sufed east of the Kamurd route, and thus outflanks the difficult Kara Kotul pass between the Kamurd and Doab valleys. From Kamurd the direct route, crossing the Kara Kotul to Doab, proceeds from thence to Kuram and Roi,

the last valley in the Hazaristan, whence it enters the district of Khulm. A branch route leaves at Kuram for Sirpool and Shibberghian, by Karchu and Balkhab, both before mentioned as Hazareh districts. Moreover, the route which runs from Candahar to Balkh through the Deh Kundi, Deh Zangi, and Deh Surkh tribes also follows the river of Balkh through the district of Balkhab of the Sirjungle Deh Zangi.

19 East and north-east of Bisut lie the tribe of Shaikh Ali or Sunni Hazarehs, who are of the same religious sects as the Eimâks, and as predatory in their habits, if less formidable in strength, as any tribe of that kindred race. The tribe is small in numbers, but some sections of the Mongols, under the name of Gubbi and Turkoman, inhabit among them. Their settlements extend along the Hindu Kush east of Bamean to near Khinjan, descending the southern slopes into the Ghorbund valley, and on the north reaching nearly to Ghorî. They infest the passes of the Hindu Kush, especially those on the Ghorbund route, and no traffic can pass thereby without payment of blackmail. They muster, with the affiliated Mongols, only some 20,000 souls, but have nevertheless a very formidable reputation both as warriors and freebooters; and in 1867 they inflicted a severe reverse, near Bamean, upon a detachment of the Cabul army moving against Balkh. The tribe pays no tribute, and is entirely independent of control. Their country abounds in iron and lead, but they have no industries of any kind, and very little cultivation, and live entirely by their flocks and herds, or by their predatory incursions, which extend as far as Inderab and Ghorî. The Sheikh Ali country is bounded on the north by Ghorî, and on the east by Khinjan, both pertaining to Kunduz; on the west by the valleys of Irak, Syghan, and Duslit Safed; on the south by the Kohistan of Cabul.

Such are the statistics of the Hazaristan, a district some 350 miles in length by from 100 to 200 miles in breadth, containing about 800,000 inhabitants, and capable of yielding a revenue of six lakhs of rupees.

The lease purchase or annexation of this tract, to be held by a Hazarah Force of 6000 men, on the model of the Punjab Frontier Force, supported by a Brigade of the regular Army at Candahar would, in the completest way, satisfy all the objects for which it might be thought advisable to undertake the occupation of any portion, of the Affghan territories.



VI.

THE KAFFIR WAR OF 1877 & 1878.

BY

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54th Regiment,

IN THREE PARTS.

PART I.

INTRODUCTION.

The object of this paper is to give a short and concise account of the Kafir war of 1877-78 and to give officers in India who take an interest in our Great Colony of South Africa an insight into the causes which led to the rebellion, and the steps which have been taken to suppress it.

It will be convenient therefore to treat the subject under the following Heads.

1st. The Geography of the Colony as far as regards the Theatres of operations.

2nd. The History of the Colony combining a summary of previous wars.

3rd. The causes which led to the war.

4th. The conduct of the war itself.

GEOGRAPHICAL SKETCH.

It would be impossible within the limits of this paper to give more than a sketch of the territory which became the scene of operations—and for additional information to those who desire to study the Geography of South Africa more closely—reference is requested to the admirable *précis* compiled in the Intelligence branch of the War Office. The Sketch Map which accompanies this summary, will, it is hoped render this part of the subject clear, and enable the reader to follow the general course of operations as they are described further on.

Leaving Cape Town and the district south of the Great Fish-River aside, as beyond the scene of war we have to consider the region comprised under the head of the Eastern frontier.

This region extending from the Orange River in the North to the Indian Ocean in the South comprises the following Districts.

- 1—Aliwal North.
- 2—Wodehouse.
- 3—Queenstown.
- 4—Fort Beaufort.
- 5—Stockenstrom.
- 6—Victoria East.
- 7—Peddie.
- 8—King William's Town.
- 9—East London.

Of these districts the following which lie between the Kei and Fish Rivers come more immediately under notice in the operations *Cis Kei*, viz :—

The Southern portion of Queenstown.
Fort Beaufort.
Victoria East.
Peddie.
King William's Town.
East London.

TRANS KEI.

North of the Kei River lies Kafraria proper comprised within the Kathlamba or Drakensberg Mountains and the sea on the one side, and from the Kei northward to the Unzimkulu on the other.

Within this area lie the following Districts which are under British rule or occupied by independent tribes.

- 1—Fingo land.
- 2—Idutywa-Reserve.
- 3—Tambookieland.
- 4—District of the Emigrant Tambookies.
- 5—St. John's territory.
- 6—Griqualand East.
- 7—Gcaleka land.

North of the latter lie two districts occupied by independent tribes, the Bomvane and Pondos.

RIVERS.

The principal rivers in the Eastern frontier provinces or British Kaffraria are :—

- 1.—Great Fish River—with two important tributaries, the Koonap and the Kat River.
- 2.—The Keiskama which rises in the Amatola mountains—with its tributary the Chumie.
- 3.—The Buffalo—rising in the Buffalo mountains and after passing King William's town flowing into the sea at East London.
- 4.—The Great Kei—which rises in the Great Winterberg—where it is called the Black Kei and in its course receives the White Kei Indwe, the Tsomo and the Geua River on the northern bank, and the Thomas River on the South, and separates British Kaffraria from Kaffraria proper.

The course of all these rivers is tortuous, flowing generally between high precipitous banks and although fordable in ordinary seasons in most parts, are only passable in a military sense at certain fords (called in the Colony, Drifts)—where the main roads cross.

They are liable to a sudden rise and then can only be crossed by Bridges or Ferry Boats—which are established in various places. In many cases and especially in the Kei the banks are very precipitous rendering passage, save at the drifts, except for Natives, impossible.

In the Transkei the Bashee which forms the Northern boundary of Gcalekaland is the only river which it is necessary to notice. It possesses the same characteristics as those just dealt with.

Topography.

The physical features of the country comprised within the limits above given are worthy of note.

The whole of this region is divided into three great steps or terraces, with generally an abrupt declivity to the South-East, and a comparatively slight fall to the North-West.

The first step is formed by the Great Chain of the Drakensberg mountains with an elevation varying from 3,000 to 5,000 ft. the second by the Winterberg, Elands Berg and the Amatolas lying midway between the Drakensberg and the sea; elevation 2,000 to 3,000 feet. The third consists of the prolongations or under features of the Amatolas to the sea coast.

The country lying between these different levels is generally undulating and fertile—a dead level such as is found in India being

almost unknown in South Africa. It is in many parts destitute of wood but in certain tracts, especially in the mountain regions, there are large forests—while in others the prickly *Mimosa* bush prevails.

ROADS.—The nature of the soil generally allows of roads to be easily made and kept up. Many are mere wagon tracks ; but with a little labour they can, as a rule, easily be made available for military purposes—the *drifts* forming the principal difficulty.

HISTORICAL SKETCH.

The Native tribes with whom we have to deal are the Fingoes, Pondos, Tembus and Amaxosa.

*The Fingoes** at the end of the last century the Zulus occupied the country about the Umfalazi North-east of Natal. Under the Chieftainship of Chaka they became the most powerful of all the native tribes and about 1810 he began a career of conquest which ended in his amalgamating many tribes with his own and driving the remnants into Basuto land, Tambookei land and Kaffraria—Chief of these were the Amabacas, a Fingo tribe which fleeing from Chaka in their turn swept other tribes before them and in 1826 penetrated southward as far as the Great Fish River.

Amapondo.—The largest tribe in South Africa, were also conquered by the Zulus and took shelter in the broken coast lands on both sides of the St. John's River (Unzimvubu). They have always been more or less friendly to the British and have given but little trouble. A small portion of the tribe is under a young chief Umquiliso on the West side of the Umzimvubu—but the greater portion about 160,000 occupy the East side under the paramount Chief Umquikela.

Amatembu† or *Tambookeis*—Whose present location is the result of being driven southward by the Zulus. Until the war of 1877-78 they have been friendly to us, though certain of their classes fought against us in the war of 1850—Their paramount chief is Gangabela.

Amaxosa or *Kafirs*—With whom we have been brought more directly in contact have been subject to fewer changes than other tribes and can trace an unbroken descent for 10 generations. They have multiplied and increased considerably and have from the days of Xosa to that of Gcaleka submitted implicitly to the paramount chief. Kreli the present chief is regarded with veneration by all, and even by those who are virtually independent.

* The meaning of Fingoe or Fengu—is a man without a home, a wanderer—and is in reality a term of reproach.

† “Ama” is a prefix denoting plurality.

Under the Amaxosa are comprised the following tribes.

Gcaleka.	...	...	under Kreli.....paramount chief.
Gaeka.	...	...	Sandilli.
T'Slambis.	...	...	Seyolo.
Ggunkwebi.	...	...	Kama.
Bomvane.	...	...	Moni

Most of these tribes have been constantly in arms against us from the end of the last century to the present time.

The Kafirs and Colonists came into contact on the Great Fish River and the first treaty was then made between them, the Fish River being the boundary.

1797. The Kafirs made an irruption into the Colony devastated the country as far as Sunday River and Swellendam on the one side, and Beaufort west on the other, and retaining possession of the land, until when they were again driven across the Fish River.

1811. The T'Slambies made an incursion into the Colony, were defeated by the Colonists at Grahamstown, and driven across the Keiskama. A treaty was then concluded making the country between the Keiskama and the Fish River neutral territory.

1819. Frequent incursions took place after this until when the first great Kafir war broke out. It had its origin in reprisals made by some soldiers and colonists for a theft of horses by a tribe of the Gaekas. It commenced as was the case in subsequent wars, by the Kafirs pouring into the colony and committing acts of murder and devastation. Every effort was made to check the enemy; troops moved up from Cape Town and Colonel, afterwards Sir Harry Smith assumed command. The Gaekas pressed by the colonial forces, sought refuge in the Gcaleka country across the Kei, with the booty they had captured, Colonel Smith crossed the Kei in pursuit and Hintza the Gcaleka chief father of Kreli came down to see him and protest against the invasion of his country although there is no evidence to show that Hintza had taken any part in bringing about the war, he was answerable for harbouring the Gaekas and a demand was made on him for 10,000 head of cattle; and he was detained in camp till this condition should be fulfilled.

1833. As no cattle came in, it was arranged that Hintza himself should conduct Colonel Smith to where they were to be found, while riding with Colonel Smith, he attempted to escape and was killed; and Kreli then a young man of 22 was raised to the Chieftanship. It was on this occasion that we first came into contact with the Fingoes, who living in a state of bondage among the Gcalekas, flocked to our standard in the hopes of regaining their freedom. The result was the emancipation of a large number, and their being located on a tract of land

on the East Bank of the Great Fish River, now the Peddie District where a settlement was formed, which afterwards became of great importance to the colony.

In this war nearly the whole of the Amaxosa were united against the Colony, the only clan that remained friendly, was the Ggunkwebe under Pato, Kama and Kobi. Soon after the death of Hintza the tribes still in arms were subdued and peace was declared, the terms of which gave us the District between the Great Fish River and the Kei.

This war, known among the Kafirs as the war of the Axe, arose from the action of the British Government on the conclusion of the war of 1835. Lord Glenelg Secretary of State for the Colonies, a member of the Aborigines protection society, condemned the action of the Colonists, and attributed to them bad faith before, and wanton cruelty during the war; the consequence was a parliamentary enquiry, and finally the restoration to the Kafirs of lands which had been declared forfeited. Such a line of conduct instead of being attributed to a love of justice and fair dealing had the contrary effect on the Kafir mind; who judging us, by their own standard, regarded such a concession as an acknowledgement of weakness and a sign of waning power.

With such a feeling existing, it was not to be wondered at that the war party in Kafirland held the ascendancy and that but little was required to bring on a fresh struggle.

A slight act led to the outbreak. A Kafir at Fort Beaufort was detected in the act of stealing an axe, and when on his way to Grahamstown for trial was rescued, and a Hottentot prisoner, to whom he was manacled, murdered. The Governor demanded the surrender of the murderers and on the refusal of the demand, declared war.

With the exception of Kama's tribe of the Ggunkwebe, the Fingoes and a few of the T'Slambies, the whole of our enemies of the former war, flew to arms. The opening of the war was signalled as had been generally the case, by serious reverses and the retreat of Colonel Somerset's force consisting of 1500 men of the 91st, the 7th Dragoon Guards, and the Cape mounted Rifles from the neighbourhood of Burns hill on the Keiskama to Fort Beaufort, before large masses of the enemy, was a serious disaster encouraging the Kafirs, who poured

See War of 1878. into the Colony, laid waste the Frontier and again checked our forces at Fort Peddie. Reinforcements were sent from England and every effort made to repair these disasters. The tide turned with the surprise of a large body of Kafirs by Colonel Somerset with a patrol of the 7th Dragoon Guards in which 350 were slain and many more wounded.

After this the chiefs were driven from their fastnesses in the Amatolas and at the close of the year Sandilli, Mhala and Seyolo surrendered themselves.

See War of 77-78.

Several chiefs however still held out and the troops were engaged in carrying out a harassing guerilla warfare in the District between the Buffalo and the Kei.

In the meantime it was found that Sandilli had only tendered his submission to gain time to plant his crops; but the Governor was so anxious to conciliate him that little or no notice was taken of his designs. In August 1847 he committed an overt act of hostility and was declared a rebel. He at once retired to his old fastnesses in the Amatolas, and a large force of Burghers, Hottentot levies, and Fingoes was collected to aid the regular troops in forcing him into submission. His strong hold was forced and he surrendered on the 19th October. In December the war was stamped out and Sir Harry Smith who had come out as Governor and Commander in Chief issued a proclamation annexing the territory between the Great Fish River and the Kei, while the frontier of the Cape Colony was advanced to the Keiskama and the tract intervening between the Keiskama and the Kei erected into a Crown Colony under the name of British Kaffraria.

Early in the year it became evident that another struggle with the
 1850 Kafirs was at hand. Sandilli with his war-like Gaikas, determined to recover his independence. The Governor Sir H. Smith considered the fears of the colonists imaginary and summoned the chiefs to meet him; Sandilli refused to appear, and he was forthwith deposed from his authority. In October he concealed himself in the forest country of the Keiskama, and in December a force was despatched to secure him and other chiefs who were with him. With a blind trust in the pacific intentions of the Kafirs, the column marched as if through a peaceful country along the road which led from Fort Cox to Keiskama Hoek in view of thousands of Kafirs who watched the movement from the surrounding heights. On reaching a rocky and narrow defile, the Boomah Pass, the force was attacked and had to fight its way with loss to Keiskamahoeck

Massacre and destruction of property now marked the opening of the war. Our Forces were in great straits. Sir H. Smith was surrounded at Fort Cox near Burnshill by large bodies of the enemy, and an attempt made by Colonel Somerset to relieve him failed, and he had at length to cut his way out at the head of 250 Cape Mounted Rifles.

In this war the—Gaikas under Sandilli, Macomo, Anta and Oba, Seyolo's tribe and Athmo fought against us—while the T'Slambies under Mgaye, the Amaggunuk Wehe under Pato and Kama and the Imdushani under Siwani supported us and did good service. The Fingoes, who had everything to lose by going against us, fought loyally on our side.

In the Transkei the Gcalekas abetted the insurgents without at first openly taking arms against us, a portion of the Tembus joined the rebellion. Added to these, the Hottentots, principally above the

Kat River, took up arms and joined the rebels in large numbers—while the others attacked Fort Beaufort. With but a small force to stem the tide of an insurrection of such magnitude, but little could be done for some months and the Eastern portion of the Colony was almost at the mercy of the enemy, although in the Guerilla warfare that was carried on the Kafirs met with several reverses.

Kreli's country having become a depôt of supply for the insurgents, and most of their own cattle and that captured by the enemy having been driven there, a force in two columns crossed the Kei, scoured the country and returned to King William's Town with 60,000 head of Cattle and some thousands of Fingoes released from slavery.

In March 1851 Sir George Cathcart succeeded Sir Harry Smith. The Amatola and Kroome Mountains, and the Fish River Bush were occupied by the enemy, and frequent and destructive raids on the farmers was the result. Kreli also took part in a raid on the Colony and treated the demand of a fine with disdain. Large reinforcements in the meantime had come out from England and Sir George Cathcart at length took the field with the 1st Battalion Rifle Brigade, 60th Rifles, 2nd, 6th, 12th, 43rd, 73rd, 74th and 91st Regiments, the Cape Mounted Rifles and some Artillery and Engineers. This force was divided, one portion to act against the Amatolas, and the other against the Kroome Mountains, and the difficult country of the Waterkloof. The Head Quarters of the army was transferred to the central position of Fort Beaufort. Sir George Cathcart also reduced the number of the of the native levies and other irregular troops, substituting in their place a force of Mounted Police, a corps which has existed to the present time, but which is now undergoing a change in designation and organization. Sir George Cathcart's first act was to call on the Burghers to aid in an invasion of Kreli's country threatening to withdraw the troops if they did not comply. In August he crossed the Kei with a Burgher force and some regulars, burnt Kreli's Kraal and captured 10,000 head of Cattle. This brought the Chief to terms.

In September the Kroome mountains were cleared and Macomo fell back on the Amatolas and joined Sandilli. In a fortnight these strongholds were forced and military posts formed round them.

In October Seyolo gave up the contest in the Fish River Bush and surrendered.

In February 1852 Sandilli and the other chiefs surrendered after having been hunted from place to place. An amnesty was granted and the Chiefs hastened to meet the Governor at the Yellow Woods near King William's Town. They were informed that the Amatolas were forfeited for ever, and their boundaries restricted to the large tract of open land, from the Kei to the Great Northern road, and northwards to the Thomas river.

When peace was fully restored several changes were made in the location of the tribes. Part of the Ggunkwebis under Kama were given the fertile valley of the Upper Keiskama; while the remainder of the tribe under Pato retained locations on the coast. The Gaikas were permitted to return from across the Kei and were located on the River Bank of the Great Kei, from the Great Kei to the Kaboosie River, and the T'Slambies were given locations they formerly occupied. The Amatola and Buffalo mountains were retained for the settlement of Europeans; while to the Fingoes were allotted large portions of the Chumie and Upper Keiskama valleys. In this year representative institutions were granted to the Colony—which was divided into two Electoral districts, the East and the West; missionary enterprise was encouraged, and the Colony settled down to the belief that peace was permanently established.

1856. "In 1856 occurred the remarkable incident known as the Cattle killing, by which the Amaxosa nation was well nigh destroyed. In obedience to the command of a prophet, who predicted, as a result of their sacrifice, the destruction of the White man, they destroyed nearly the whole of their Cattle and their stores of grain, leaving their fields unsown. As a result of this act of madness 50,000 persons perished being about one-third of the entire nation."

"The chiefs and notably Kreli had supported this measure, probably with a view to inciting his warriors against the colonists, when they had nothing to lose and everything to gain by a recourse to arms. The Government therefore determined to punish him, and in consequence he, with the famished remains of the Gcaleka tribe was banished from his country which then extended from the banks of the White Kei and the T'Somo to the sea, and was driven in exile beyond the Bashee, and the whole extent from that river to the Kei converted into a vast unoccupied neutral territory."

1862. In 1862 Kreli was permitted to recross the Bashee and occupy the Southern extremity of the country of which he was dispossessed in 1858; but no sooner had he settled in this country than it was filled up by the Gcalekas, many of whom had collected cattle by service on the Colony and from other sources; and at once began to cry for more land, which has been continued from that day to this.

1872. The jealousy and bitterness which had long existed between the Gcalekas and the Tembus under Gangalizwe culminated in a war in October 1872. The Tembus were defeated and the result was such as to give Kreli a false idea of his power and to seriously endanger the Colony, by the establishment of a strong war party among the Gcalekas. There is but

little doubt that had Krelī when permitted to re-occupy his own country been placed under proper control and his ambition kept in check the present war would not have broken out. This will be dealt with further on as one of the causes which led to the present struggle.

CAUSES WHICH LED TO THE WAR OF 1877-78.

For some time past the absorbing interest of the Eastern question naturally occupied the minds of Englishmen, both in the mother country and in India, far more than affairs at the Cape; and even had more eagerness been shewn for news, the information obtainable through the newspapers has been so meagre and often so incorrect as to mislead rather than inform the general public. We may add to this the want of telegraphic communication with the mother country which has prevented the course of events being known in England till a fortnight after their occurrence.

These events however, demand more than a paragraph in the *Times*; South Africa is passing through a crisis, the issue of which is fraught with the highest interest to the Colonists and to England. A storm wave which commenced on the banks of the Kei and spread over the Eastern provinces, has extended northwards among the tribes in our lately acquired possession of the Transvaal, and will probably sweep through Zululand, and finally break on the Limpopo or the Zambesi.

In America, in Australia and New Zealand the effect of the contact of civilization with the Aborigines has been to gradually thin their numbers; so that in the course of time whole tribes have disappeared, and nothing is left but their name. In South Africa on the contrary, the natives rank physically among the finest races in the world, and instead of dying out with the advance of the white man have increased in numbers; and being a pastoral people whose riches consist in flocks and herds, in many cases the tracts of country to which they have been confined by our encroachments have become too small to hold them.

In their original condition of barbarism the Kafirs unrestrained by British influence have always looked to increasing their territory at the expense of neighbouring tribes, or by eating up, as it is termed, the prosperous in their own land, as is the case to this day in Zululand. It is not to be wondered at therefore, that true to their old habits of war and spoliation the Kafirs of to-day should strive to break through the restraints imposed on them by the presence of the white man on their borders, and should cast greedy eyes on the possessions of those tribes, who have increased in material wealth under our protection, and desire to extend their own borders at their expense.

The question of how best to deal with the turbulent and warlike tribes that are scattered through and border our territory, has always been a difficult problem to solve, and it will we think be allowed that

the war now under discussion might have been avoided had the policy of the Government of the Colony been based on a correct appreciation of the native character and have been one of plain and fair dealing. As these remarks apply more particularly to the Gcalekas, with whom the war commenced, the question as it especially affected them will be briefly entered into.

The summary given of the wars of 1835-36-37. has shewn what part was played in them by Kreli and his father Hintza before him.

Opinions differ as to the real character of Kreli. Many who have been for years in contact with him, describe him in terms of the highest praise, and are loth to attribute the ruin which has fallen on himself and people to his direct agency; while others give him credit for no better quality than that of a wily and treacherous savage. Be this as it may, he may be regarded as a good type of his race with perhaps a larger proportion of their virtues than of their vices.

His great influence as paramount Chief, the character of his people as a warlike tribe, and the presence on their borders of their ancient slaves the Fingoes, growing fat and prosperous under our protection and living on lands, which had formerly belonged to the Gcalekas, made it imperatively necessary that our dealings with Kreli should be characterised with justice, firmness and dignity. This was not so.

After the Cattle killing in 1856 the Government to punish him for the share he had in it, kept him in bondage for some years. Thoroughly humiliated and professing much, he was allowed to move back in that portion of his country lying between the Bashee and the Kei. His submission and earnestly expressed desire to be under British rule and under the orders of a British Magistrate was sufficient proof at that time that his spirit was broken and had the Government placed in his country an energetic sound hearted and high spirited gentleman as administrator, with well trained and competent officials under him, he and his tribe might have made great advances on the road to civilization. But what did the Government do. It left him for many years with a resident who had no clerk, who was paid a miserable pittance on which to support a family and who lived for years in an improved Kafir Hut, with a hut for his office. It could not be expected that any person could under such circumstances impress a savage chief or his people with a proper sense of his dignity or raise the nation he represented in their eyes. No money was spent in the country for the establishment of schools or industrial institutions, the country was not opened out by the construction of roads nor was anything done for the welfare of the people. Missionaries there were, but they were established by private enterprise and were the only civilizing influence brought to bear.

Practically left to his own devices, as his people multiplied, Kreli's old ambition returned; his young warriors called out for more land, and he went to war with the Tambookies against the will of, but unres-

trained by the Government. This war which would never have occurred had the conditions for which he stipulated in 1862 been carried out, was the outcome of the culpable neglect of the Colony. Sir Bartle Frere himself states in a despatch to the Secretary of State in November 1877 in commenting upon the happy go lucky policy regarding Kreli, "that he and his councillors gradually persuaded themselves that he was really in some sense independent, and might follow the dictates of his own will as paramount Chief and repeat with impunity on his disagreeable neighbours the prosperous Fingoes, the same process which had been attended with so much success when he made war on the Tambookies, without the leave and against the will of the Government five years before." Further on in the same despatch it is stated, "that it is useless to attempt to raise a tribe in civilization by the agency of those whose direct interest it is, or whose existence depends on keeping the tribe in their original state of unprogressive barbarism." The truth of this statement has been put to the proof in many cases, and notably with Kreli's neighbours, the Fingoes. A writer well acquainted with the native character and whose letters on this subject are published in the Blue Book, states (writing in 1867) that, "up to that period every step taken by the Government had been calculated to lessen the respect of the natives for the prestige of the British name and consequently to diminish the influence of the agents placed among them. This resulted in the Fingoes falling back into heathenish customs, and Witch Doctors the worst of demoralising agents among natives were fast extending their influence among them."

It must be borne in mind that the Fingoes were at this time British subjects and were entitled to be governed and protected as such, and the picture drawn of their condition and the many examples given of the rapidity with which they had retrograded proves how far they had been neglected. Awaking at length to a sense of what may be called the iniquity of such a system, the Governor suspended the Fingo agent and in his place appointed an officer who was possessed of all the qualities in which his predecessor had been deficient. The result was surprising, Schools and Churches rapidly increased throughout the Colony; Canteens were banished from the land, money was raised among the people to open roads, and for other purposes, and the people increased in material prosperity. This shews what can be done with the natives under a wise ruler; and had the Government dealt with Kreli and his people in a similar manner, it is hardly too much to believe, that he would still be in his own country instead of an outcast and a fugitive, and his people scattered. The Fingoes may be cited as an example that the savage races of South Africa are amenable to civilizing influences, but to insure this result, they must be brought into immediate contact with the best and highest minded of our race, and be ruled with consummate justice and firmness.

By such means only can they be weaned to a more healthy existence, and it is the great want of real knowledge of the native character, so often shewn among colonists that engenders suspicion and want of trust and alienates many a friendly tribe from us.

Broadly stated therefore, the first and main cause of the war was mis-government—or rather an absence of Government during a series of years, of the Kafir tribes, and more especially the Gcalekas; other and secondary causes were:—

1st. The Clan system which prevails among the Kafirs and which had its exact counterpart in old days in the Highlands of Scotland. It allows every chief to have at his back a fighting force of varying strength whose highest wish is to prove their bravery in war and enrich themselves at the expense of their neighbours. When these Clans combine at the call of the paramount chief—whose will is law—to make common head against an enemy, their numbers swell into a large and formidable army and until the Clan system is eradicated the problem of dealing with the natives will have many a difficulty added to it.

2nd. The feebleness of the force the Colony had to rely upon, in the event of a rising among the tribes and the absence of any scheme of defence. The Kafir judges by what he sees and hears, and when the actual force in the Colony consisted of one British Regiment and a few hundred police scattered over a wide area, he naturally argued, "what are these to the thousands we can bring into the field at a moment's notice."

For this state of insecurity the Government at Cape Town were in the main responsible; for although in 1876 a Volunteer and Burgher Bill was laid before them, it was thrown out and nothing substituted in its place. Added to this the representations that poured in from the Eastern Frontier of the hostile intentions of the native Chiefs and the evident signs of an approaching outbreak, were put on one side as groundless, and due to the fears of the ignorant and timid, on the frontier.

3rd. An idea had got possession of the native mind, that the success of the British, in former wars, was due to the arms they carried, and that they had only to arm themselves in the same manner to render them invincible. Hence for years past a large trade in Guns and Rifles had been carried on, and in every *Kraal a large proportion of the warriors were so armed.

But save behind a rock at 10 yards distance, the Kafir is not nearly so formidable an enemy with a gun as he was in old days with his assegai. He has rarely any idea of taking aim and nothing could have been worse than the shooting of both our enemies and our allies in the various actions that were fought. The old traditional tactics of first surrounding and then closing with the enemy were laid aside and after a few encounters when the deadly accuracy of the Henry Martini and Snider was shewn, hand to hand fighting was very rare.

* "Kraal" collection of huts forming a native village.

THE WAR OF 1877-78.

The quarrel between Gcalekas and Fingoes.

In dealing with the causes that led to the war no mention has been made of the other Kafir tribes, the Gaikas, T'Slambis &c., there is but little doubt that obeying the behests of Krelī as paramount Chief it was the intention that the rising should be general and simultaneous ; but as has so often been the case in India and elsewhere, the power of combination among coloured races is not great.

It would however appear that we are indebted to an accident for the war not having broken out simultaneously, and that at a certain day the war cry was to have been sounded by all the insurgent tribes.

When a people naturally warlike have been for two years or more fed with the idea that they are to attack their enemies, the less thinking portion of them are tolerably certain to chafe at delay, and perform some aggressive act which will precipitate matters. This appears to have been the case with the Gcalekas, and it was the more natural when we consider their enmity to their old slaves the Fingoes.

On 10th August 1877 occurred an event which led immediately to the war. On that day a party of Krelī's tribe under two petty Chiefs, crossed the border for the purpose of taking part in a marriage festival in Fingoland.

At night an altercation arose, ending in blows and the Gcalekas were eventually driven across the border; one of their party being wounded to the death. Three days after this, four large bodies of Gcalekas crossed the border, and swept off all the stock of the neighbouring Fingo villages, consisting of 140 head of cattle and 600 sheep and goats. This led to reprisals and in order to maintain peace, 120 police were despatched to the Transkei. Krelī himself disowned any participation in, or approval of, what had taken place, but the Government agent, Mr Ayliff, and the secretary for native affairs both expressed their doubt whether the movement could have occurred without his connivance.

It is possible that originating as it did in a drunken squabble it had no real significance, and that Krelī had no hand in it, but it had the effect of precipitating a rebellion which there is every reason to believe would have broken out four months later, in December after the gathering of the Crops; experience of former wars having shewn that the natives generally choose this time for rising.

The result of the news among the Colonists was a scare. Traders commenced to leave Gcalekaland and all the frontier towns were in a great state of alarm, which somewhat quieted down with the advent of Sir Bartle Frere at King William's Town on the 4th September; and

the news of the dispersion to their homes of large bodies of Gcalekas that had assembled on the frontier. Most men of experience however, were not at all satisfied that matters would end here; they were too well acquainted with the signs which always precede a contest between the white and black races, and urgent demands were made that steps should be taken to guard against a war which appeared inevitable.

Sir Bartle Frere anxious to judge of the state of affairs at the scene of the late disturbances, left King William's Town on the 13th September, and proceeding via Komgha, the chief frontier post of the police crossed the Kei to Taleni. From thence he traversed Fingoland conferring with the magistrates and other Government officials on the way. He found that the Fingoes in obedience to Mr. Ayliff, the commissioner, who had great influence with them, had fallen back, and driven their cattle away from the border, in order to avoid all risk of a collision. The task of restraining them was one of some difficulty, as in their skirmishes with the Gcalekas they had been generally successful. A less satisfactory state of affairs was found in the Idutywa Reserve, a district of British territory with a mixed population of Gcalekas, Tembus, Fingoes and broken fragments of other tribes, who had begun to plunder and murder among themselves.

As this was due to the incapacity of the magistrate, who although there was a strong detachment of the Frontier armed and mounted Police on the spot, failed to apply to them for support, he was removed, and an energetic and capable officer of the police, Mr. Chalmers, was appointed in his place.

Matters did not however quiet down in the Idutywa Reserve daily inroads being made by the Gcalekas attended with loss of life.

The Governor then sent friendly messages to Kreli through Colonel Eustace, the Resident in Gcalekaland, inviting him to visit him, and urging him to put a stop to the lawless acts of his people. But Kreli, whatever his own ideas might have been, was the victim of divided councils; on one side the elders of his tribe counselled him to make concessions; on the other the young warriors clamoured for war and threatened to drive the hated Fingoes into the sea. Mistrusting the intentions of the Governor who he believed intended to make him a prisoner, Kreli, without actually refusing the meeting, sent indefinite answers.—Sir Bartle Frere finding his efforts to obtain a personal interview, or a promise to give satisfaction for the outrages committed useless, commenced his return journey to King William's Town. Just before he left Butterworth reports reached him of fresh inroads and plunderings by Gcalekas in British territory in disregard of the warning given by the magistrates and police, and he accordingly instructed Colonel Eustace to make one more attempt to induce Kreli to restrain his people, and failing, to retire across the border. Kreli's reply was, that the people were beyond restraint and Colonel Eustace retired on the 23rd September to Ibeka, a point whence the boundaries

of Gcalekaland, Fingo land and the Idutywa reserve converge. All efforts to obtain a peaceful settlement of these difficulties having failed it now became necessary to resort to forcible means of repression.

Preparations were made to localize the disturbance, and confine it if possible to the Transkei districts, occupied by Krel's Gcalekas.

It was felt that this would be a matter of considerable difficulty, from the sympathy felt by other tribes with the Gcalekas in their attempts to expel the Fingos, and the necessity that existed of putting a check on the Gcalekas by force, might be the signal for an outbreak among the Gaikas and others, whose chiefs were known to be in communication with Krel.

It was now thoroughly realised how utterly inadequate were the means of defence within the Colony, resulting as might be expected in reckless expressions of apprehension and suspicion by many, thus exciting the fears not only of our own countrymen as to what the Kafirs might do, but also agitating the minds of the Kafirs themselves as regards our intentions towards them.

At this time the total regular force in South Africa was 5 Infantry Regiments.

These were scattered over an immense area comprising Cape Town, the Eastern provinces, Natal and the Transvaal, a distance as the crow flies of 1000 miles. The threatening attitude of Cetuywayo, the Zulu King, rendered it unwise to withdraw any troops from either Natal or the Transvaal so that only two Regiments were left for service in Kafiraria, the 1st Battalion 24th Regiment, quartered at King William's Town, and the 88th "Connaught Rangers" at Cape Town.

As regards Colonial forces the only corps available was the Frontier armed and mounted police, numbering 1,100 men. They were a fine body of young men, as good material as could be desired, armed with Snider Carbines and revolvers. But most of them were recruits, their discipline and organization were not of a high order, and they were deficient in experienced officers and non commissioned officers.

They were commanded by Commandant Bowker, who had had much experience in former Campaigns; but from long service and bad health was unequal to the hardships of war.

Other forces, Volunteer or Militia, there were none, and worse than this there was no legal provision for organising a defensive force for the Colony; and although volunteers flocked to the Standard of duty in large numbers, the weakness of voluntary effort unsupported by law was soon apparent.

Possessed of an excellent spirit; inured to hardship from the nature of their occupation as farmers, and good riders, no better material could

exist than the volunteers, for the nature of the warfare they were called upon to engage in.

But with all these good qualities the element of discipline was necessarily absent, and it was often found, that when brought into contact with the regular troops both men and officers regarded them with jealousy, and acting under the erroneous assumption, that it was only a colonist who understood the art of warfare with savage tribes, were impatient of any orders or dictation as to the best method of crushing the rebellion. This feeling which extended even to the members of the Government itself and was fostered by the press, which in the Eastern Frontier, was of no very high order, and had never ceased to criticize in no friendly spirit the acts of the Commander of the Forces and the Imperial troops, led at length to very grave trouble which at such a crisis was much to be deplored.

Any one who has fought side by side with the volunteers will give them every credit for their many good qualities, and it is not to be supposed that the two elements regular and irregular were always antagonistic, but the colonists regarded the war as their own especial property and themselves as the most capable of bringing it to a successful issue.

Combined movements they ignored as a waste of time, and the many and most arduous duties of escorts—patrolling &c, were regarded with distaste by men whose only idea of war, is fighting the enemy wherever you see him, regardless of any definite plan which the Commander of the Forces may have in view.

On returning to King William's Town from his visit Transkei, the Governor proceeded to confer with Sir Arther Cunnyngame, Commanding the forces, as to the military necessities of the situation, and a memorandum was published for general information giving particulars of the steps taken by the Government for the security of the frontier as follows:—

The Frontier armed and mounted police occupied the following posts extending from Greytown (Fort Cunnyngame) on the main road to Queen's Town on the borders of the Gaika location, to the mouth of the Kei—viz

Fort Cunnyngame.
Komgha.
Pullen's Farm.
Impetu.
Kei mouth.

With advanced posts Transkei, at Taleni, Ibeka and Idutywa. King William's Town situated in a central position in rear and garrisoned by the 1st Battalion 24th Regiment was well placed as a depôt of supply

and was connected with the port of East London by rail. The railway from East London to the Kahousie River formed a good line of communication, with defensible stations every ten miles, and at intervals plate-layer's cottages easily defensible by a few resolute men. Arrangements were made for the supply of arms to the Burgher forces, and Burgher Commandants were appointed for the various divisions.

Mr. Griffith succeeded Mr. Bowker, as Commandant of the Frontier police; with a view to his taking general command of the Colonial forces in the event of any occasion arising.

Colonel Glyn 1-24th Regiment was placed in command of the Eastern district with instructions to assist in organising the Burgher forces.

The actions of Gwadana and Ibeka.

As has been already stated the visit of the High Commissioner to the Transkei and the efforts of the executive officers, both, had failed to put a stop to the incursion of the Gcalekas, but up to the 26th September actual collision by the Police had been studiously avoided. This portion of the force 350 strong, under Inspector Chalmers held the posts already mentioned guarding a frontier of about 50 miles.

All the white men in Kreli's country had left some days before Colonel Eustace retired to Ibeka; Kreli in some cases actually furnishing them with escorts to ensure their safe conduct and stating openly that he was powerless to restrain his people.

One Gcaleka chief "Mapassa" who was at enmity with Kreli refused to join the war party or to attend their Councils; and tendering his allegiance was allowed to cross the Kei to land assigned to him in the valley of the Chichaba. He was accompanied by Mackinnon Umhala, chief of a section of the T'Slambie tribe who had long been a resident in Gcaleka land and who refused to join in the revolts; with them crossed some 4,300 men and women.

On the 26th September Mr. Griffith arrived at Ibeka and assumed command of the Frontier police. He found at Ibeka a patrol of 80 men under Inspector Chalmers which had just come from Idutywa, and learning from them that large parties of Gcalekas had been observed within the frontier directed him to return and drive them back. On his road to Idutywa, Chalmers found a considerable body of Gcalekas fighting with Fingoes near the Gwadana mountain. He at once attacked and drove them along east of the Gwadana ridge. In the course of the action a 7 pr. mountain gun which had been used with some effect became disabled, and had to be withdrawn. This appears to have caused a panic among the Fingoes, who fled, which encouraged the Gcalekas to return to the charge, and at nightfall Inspector Chalmers, having lost an officer and six men, retired, in no very good order, when we learn from the official dispatch, that he and most of his officers got

separated from the main body and reached Ibeka late in the night: while the men themselves and the gun with two officers reached Idutywa, 15 miles distant from Ibeka.

This affair, which commandant Griffith allows was a reverse, greatly encouraged the enemy and finding it impossible with his weak force to hold both Idutywa and Ibeka, he abandoned the former place on the 27th and concentrated at Ibeka.

Ibeka from its position on the junction of three roads was a post of strategic importance, but like many other places in South Africa was little more than a name, being represented by a trader's shop and a few outhouses situated in an enclosure some 80 yards square, surrounded by a sod bank about 3 ft 6 in height and a ditch 3 feet deep. Placed on a commanding ridge it is tactically a strong position. The enclosure was strengthened by an epaulment of sandbags at one of the angles in which a field gun was placed, but it was not considered necessary to take any further steps to render it more defensible.

On the 27th and 28th September large bodies of the enemy appeared in front of the post which was now garrisoned by 200 of the Frontier police and three 7 pr. guns and some rockets. In addition were outlying parties of Fingoes numbering in all about 2000 men under Sub Inspector Allen Maclean.

On the 29th the expected attack on the post took place, the Gcalekas advancing in a swarm and driving back the Fingoes who moved out to meet them.

This advance was checked by the fire of the guns and rockets under Captain Robinson R. A. and the Fingoes taking heart charged and drove them back. After an action which lasted for 3½ hours during which the Police appear to have acted entirely on the defensive, within the intrenchment, the Gcalekas retired in good order, having it is stated, suffered severely. Our loss being one policeman slightly wounded and 6 Fingoes killed and 6 wounded. The enemy it is said removed their killed and wounded during the night, a statement which may be doubted as far as regards the dead. Kaffirs have a superstitious dread of touching a dead body and except in the case of a Chief they as a rule leave them where they fall. The losses of the enemy in these actions were in fact never known, although it was reported that in the fight at Gwadana 300 fell and at Ibeka 200. In both cases and more particularly the first, the numbers are greatly exaggerated having been given, not from personal observation of the numbers left lying on the field, but on the estimate of those who judge from the time an action has lasted and the amount of ammunition fired.

When we consider that the first encounter was a reverse and that the police were on both occasions young and inexperienced, while the Fingoes are very bad shots, we may reduce the sum total to a quarter or a third.

This tendency to magnify the losses of the enemy continued among the volunteers throughout the war, and it was not until the Commander of the Forces refused to accept any returns of killed, unless accompanied by a certificate that the dead had been counted, that the reports could be relied on.

The night that followed the action at Ibeka was exceedingly dark and misty and the outlying picquets were aware of the enemy, who in small parties was moving about round the post. At daybreak one of the picquets hearing a body of mounted men approaching through the fogs fell back firing. At 5-45 A.M. the mist lifted and the enemy was discovered on the left of the position. The guns and rockets opened on them, followed by an attack by the Fingoes, supported by 60 of the police. The Gcalekas fled and were pursued for about 2 miles, about 30 of them being killed. In this action the police appear to have fought with more confidence; the advantage of taking the offensive over the passive defence of the day previous was apparent.

The Fingoes also under Maclean and Vellman one of their principal chiefs were said to have fought well; but with an enemy flying before them this is not surprising.

The guns also were better served and did more execution.

Affairs having assumed so serious an aspect, Griffith telegraphed for reinforcements, the Commandants of the King William's Town and East London Districts were ordered to raise as many Burghers as possible.

But few Burghers could, however, be obtained on the border. Panic stricken by the imminence of the danger, the farmers had either gathered in Laager* at a considerable distance from the frontier or had taken their wives and families to the nearest town and were not prepared to turn out until they had provided for their comfort and safety.

Two hundred volunteers were however raised in the town of East London, and marching day and night arrived at Impetu about the 30th September. The other chief frontier towns were not backward in calling for volunteers and at Port Elizabeth, Grahamstown, Queenstown, &c., men came forward in large numbers for the defence of the Colony. Lieutenant General Sir Arthur Cunynghame was placed in command of all the colonial forces including the Police, the Volunteers, the Burghers, and Native levies. Commandant Griffith was given the temporary rank of Colonel in the army and the following gentlemen were appointed Field Commandants. East London, Captain Brabant; Queenstown, Mr. John Frost; Fort Beaufort, Mr. Benjamin Hall; King William's Town, Mr. Schermbrucker; Regulations were framed for the

* Laager — a Dutch term applied to a small defensible post in which Farmers and others congregate with their families and wagons for mutual protection

harmonious working of the heterogeneous elements of which the defensive force,—Imperial and Colonial, was composed ; the method of communication between the Military and Civil Authorities simplified ; and the relative rank of colonial officers and their position as regards officers of the Imperial army duly fixed.

The pay of Mounted Volunteers was fixed at 5 shillings a day while in the field with rations for man and horse ; that of Foot Volunteers at 4 shillings and rations.

On the 30th September Her Majesty's ship "Active" embarked a detachment of the 88th Regiments under Major Hapton, consisting of 6 officers, and 217 Non-Commissioned officers and men at Simons Bay. This reinforcement was landed at East London on the 3rd October and was at once pushed forward by rail to King William's Town.

In order to raise the strength of Griffith's weak force of Europeans, across the Kei, the police which garrisoned the various Frontier posts from Cathcart, eastward, were withdrawn to join him and their place was taken by details of the 1-24th and 88th viz.

88th Regiment	100 men and 1 gun—Cathcart
"	100—1—Fort Cunnyngname
1-24th—"——	200—1—Kongha
50 men	—————Draabosh
50 ———	—————Pullen's farm

The detachments at Fort Cunnyngname and Cathcart held the Gaikas in check—their loyalty being doubtful ; notwithstanding that Sandilli, at an interview with Sir Bartle Frere, had deprecated any intention of joining the rebels, and promised to "Sit Still."

On the 3rd October Commandant Griffith's force at Ibeka had swelled to 700 white men of which 500 were police, and 200 mounted Burghers and Volunteers, all armed with Sniders ; and 2,500 Fingoes armed with guns and rifles of which 500 were Sniders. A few days later 300 more mounted Volunteers joined him, and with three 7 prs. and one 9 pr. he was prepared to take the field. Provisions for 1,000 men were stored at Ibeka, but there was a great want of ammunition for the Native levies.

Griffith's communications via Taleni and Kei Bridge Drift were secured, and the East London Volunteers under Captain Brabant were prepared to move from Impetu to the Ebb and flow drift near the Kei mouth. The authorities not feeling at ease regarding the loyalty of Mapassa's men who had been located in the valley of the Chichaba, determined to utilise them, by placing them on the East bank of the Kei, supported by some volunteers, where they would be less dangerous than on the West bank, among the Gaikas and T'Slambies who were showing signs of unrest.

It was also proposed to create a diversion by landing a force of 300 or 400 men at Mazeppa Bay on the coast of Gcalekaland and form there a permanent depôt of stores to which Commandant Griffith might have recourse when he moved to the sea coast. The advantages of such a move were obvious, but the dangers of landing through the surf and the want of men rendered it impossible, and it was moreover considered the same result could be obtained, with less risk, by an advance across the Kei at the Ebb and flow drift.

Owing to the want of ammunition for the Fingoes, Griffith was still delayed from making a forward movement and carrying out his plan of operations against the enemy, but recognizing the bad effect of absolute inactivity, he determined to inflict as heavy a blow as possible with the means at his disposal.

Accordingly on the 9th October he advanced in three columns from Ibeka, Butterworth and the Springs—converging on Krel's "Great Place," which he determined to destroy—another column from Idutywa (which had been re-occupied) under Major Elliott chief magistrate of Tembuland, at the same time advanced to Talun. This operation was successfully carried out. The Ibeka and Butterworth columns arrived at Krel's great place at daybreak, surprised the enemy and drove them over the Cora river. The Kraals were burned and several of the enemy killed. The column from the Springs met with some opposition but drove the enemy back with a loss of two men the only casualties on our side. That from the Idutywa found itself opposed to some 3 or 400 Kafirs on the Talun, but routed them without difficulty.

From this time to the 17th October, Griffith was waiting for supplies and transport to enable him to advance through Gcaleka land to the Sea. During this period the forces were supplied entirely under Colonial arrangements, which from want of proper organization were very defective, delaying the field operations and forming the subject of numerous complaints as to the insufficiency of food. On the 10th October Griffith commenced his movement. His force was divided originally into four columns, that on the extreme Right starting from the "Springs," the next in order being the Head Quarter Column from Ibeka: that under Inspector Hook from Ibeka, and the extreme left consisting, of a strong body of Tembus with the chief N' Gangelizwe and 200 Europeans, the whole under Major Elliott, from Idutywa. Two 7 pounders accompanied the Head Quarters column and one 9 pounder, that under Hook. The theatre of operations was divided equally by the Kogha (or Cora), a river fordable for wheeled carriage only at the mouth and near its sources in the vicinity of Ibeka.

It was resolved to clear the Western district first, large numbers of the enemy having been seen in the rough country bordering the Kei. The Ixakaxa mountain was selected as the pivot of this movement, as it covered the flank of the Head Quarter Column and threatened the retreat of a hostile force stationed in the valley of the Kei. Inspector

Hook's Column was therefore directed on this point with the order to form a standing camp. Upon this Hill as a pivot, the Head Quarter Column and that on the extreme right having effected a junction, were to sweep round to the left to the sea, clearing the country as far as the Manubie-Forest and the Kogha River. Elliott's column was ordered to keep well in rear during the movement for fear of its being crushed by the large forces of the enemy retreating to the Bashee. The object of this plan was to clear the immediate vicinity of the Colony from the presence of the enemy without serious opposition, since Kreli could hardly accept battle with his retreat menaced by Hook and Elliott.

On the 19th the Head Quarter column effected a junction with that from the springs, and reached the mouth of the Kalogha (Kolora) on the 20th; crossed on the 21st by the bar of sand which closed its mouth, and turning northward crossed the Kokinaba; and on the 22nd joined Hook's camps at Lusizi having met with no opposition. Hook, who had reached Lusizi, on the 19th, was attacked on the 21st, and in driving off the enemy suffered a loss of 2 officers and 9 Fingoes killed, and 1 Volunteer and 21 Fingoes wounded.

Elliott's column had in the meantime moved to Taleni (or Talun), from whence he sent patrols to scour the country in the neighbourhood, and dispersed with loss a large body of the enemy who were collecting in parties of 200 or 300 strong, with the evident intention of concentrating in the wooded Kloofs in the vicinity to attack him.

The next few days were occupied in making reconnaissances in force along the line of the Kogha and the Manubie forest as far as Mazeppa Bay. No enemy was discovered, and he had evidently retreated towards the Bashee. On the 27th heavy rain set in, which retarded any movement for three days.

On the 30th Griffith moved from the camp at Lusizi and marched through the Manubie forest to the mouth of the Kogha, which was crossed the same afternoon, and the march continued to the Jujuga on the opposite bank of which the force bivouacked. The road being impracticable for wagons, the men carried 5 days provisions in their wallets, and the wheeled transport was sent via Ibeka to meet the column at a point on the road to Fort Bowker.

On the 31st the Sheuani was crossed, and the column turned northward towards Fort Bowker, its flank being protected by three columns of Fingoes, which moved towards the Bashee to clear the whole of the intervening country of the enemy. On the 3rd November the force having formed a junction with Elliott's column, encamped at Fort Bowker, Elliott had in the meantime been very active in capturing cattle, large numbers having fallen into his hands. At this time some of the Volunteers, whose period of engagement had expired, became impatient and expressed a desire to return home; but it was necessary to complete the work done by pursuing the enemy to the Umtata, and they were persuaded to remain for another fortnight.

On the 5th November, Elliott was sent from Fort Bowker to co-operate with the Fingoes in clearing the Udweassa, with orders to cross and take position on the other side of the Bashee.

On the 7th, Griffith, having left a force to occupy Fort Bowker, proceeded down the left bank of the Bashee with 490 Europeans and two guns, with the object of cutting off the Gcalekas driven across the river by Ayliff's Fingoes. On the 8th he reached Moni's (the Bomvane chief's) kraal, falling in on the way with small parties of fugitive Gcalekas, who allowed themselves to be disarmed without opposition, and the same night he opened communication with Elliott and Ayliff. The latter was ordered to move the next morning up the valley of the Bashee as far as the mouth of the Ucebana river, while Griffith himself breaking his column into three patrols, moved on the same day to clear the valley of the Ucebana. From this point the columns swept towards the Umtata, capturing a considerable number of cattle and meeting with little opposition. On the 13th Griffith joined Elliott's column five miles from the mouth of the Umtata, while the Fingo levies and some Volunteers crossed the river higher up, with orders to scour the east bank towards the sea. But by this time the main body of the rebels had crossed the Umtata, and were safe in Pondoland; Political reasons as well as military were adduced to show the advisability of giving up the pursuit.

The presence of the force in Pondoland would, it was feared, unsettle the people and lead to complications with Umquikela, who was supposed to be but badly disposed towards us; while on the other hand Griffith was far from his base, and many of the Volunteers were tired of the war and wanted to go to their homes.

The horses also were in a bad plight, and the country so difficult as to render the transport of supplies almost impossible. Military operations were accordingly declared at an end, and Griffith recrossed the Umtata on the 17th November, having in a conference with Unquiliso, a Pondo chief, friendly to the Government, requested him to take up the pursuit, telling him to keep all the cattle he could capture.

On the 19th the Volunteers and Fingo levies, with a few exceptions, marched for the colony to be disbanded, and the task of guarding the line of the Bashee was committed to four troops of the police, and a few Volunteers who remained. One troop of police were stationed at Idutywa, two troops and a 9 pr. gun at Fort Bowker, with orders to hold that post and patrol the banks of the Bashee, and the Volunteers to Talun, on the line of communication between Ibeka and Fort Bowker. The Fingoes were ordered to watch the line of the Bashee.

Commandant Griffith, in his final dispatch, reported 700 of the enemy killed, among whom were 20 chiefs, and the capture of 13,000 head of cattle. He received great praise for the success of the operations, and was made a Commander of the Order of St Michael and St. George for his services.

The unqualified praise he at first received, not only from the Government but also from the Commander of the Forces, was perhaps somewhat premature; but the colony was only too anxious to consider that the enemy had been thoroughly beaten and had been driven from their country never to return, which as will be seen, was not the case. Commanding as he did, a force of Volunteers led as a rule by men who neither knew nor appreciated the value of combination, it would be unfair to judge of his movements by a military standard; but there is little doubt that the most was not made of the advantages he possessed, of fighting a retreating and demoralised enemy; that his movements considering the mobile nature of his force were slower than they might have been and that after the 30th October there was an absence of any plan save that of driving the enemy before him. By pushing across to the Umtata in the first instance he might have intercepted the enemy, and delivered a crushing blow; whereas none was given and the independent action of Commanders of the Police and Volunteers in cutting off cattle had more charms than combining to carry out a clear and settled plan. It is perhaps natural that men who have left their homes to endure the hardships of this kind of warfare, should look to the last as a compensation; but nothing is more demoralising or more detrimental to the proper conduct of military operations, than this lust for cattle lifting. It has always been more or less a feature in Kafir warfare and necessarily so, since by depriving the Kafir of his cattle, you take his all; and the only way to injure an enemy, who so seldom meets you in fair fight, is to deprive him of his means of existence. But the regulations regarding the distribution of captured cattle were throughout the war so lax, and the Volunteers had been so accustomed to regard cattle lifting as the main object of their being in the field, that without this incentive it was at times difficult to get them to move; and important military operations were often frustrated by this neglect of orders, in order to be before hand in a large capture.

During the months of October and November active operations were carried out, almost entirely by the Volunteers, while the less agreeable task of holding posts on the base of operations, and maintaining communications, was undertaken by the 1-24th and 88th Regiments, with the addition of Volunteers and Burghers of the districts on the border, the object being to prevent sympathisers with the Gcalekas from taking part in the rebellion.

While Griffith was conducting operations in Gcalekaland, affairs on the other side of the Kei were anything but satisfactory. Allusion has been already made to two chiefs, Mapassa and Mackinnon Umbala, T'Slambies, who when the outbreak commenced in Gcaleka land, signified their wish to keep clear of trouble, and were consequently located on land on the west bank of the Kei. It was a moot question at that time whether or not they should be disarmed, and there is little doubt that they would have consented at once had they been frankly dealt with. But so much distrust pervaded the minds of all, at that time, that it was considered

unwise to attempt it. During the month of September the proposal to disarm them was made more than once, and it was only on the representation of Mr. Fynn, the officer in charge, that it was not done. He very properly argued that at such a time, when the mind of the whole Amaxosa nation was in a state of ferment, it would be likely to create an unfavourable impression. In fact one of the great faults of the Colonial Government in dealing with the natives became apparent. Here were two chiefs, who had refused to join the war party and had thrown in their lot with the Government, but instead of being met with confidence, they were treated with suspicion, and a series of blunders eventually turned one of them from a friend to an enemy, and had the very effect which it was the object to avoid. In the middle of November it was finally decided to disarm these chiefs, and to locate them in the deserted country of the Gcalekas. A Government officer proceeded of Impetu and summoned them to meet him. This they did, and were informed that it was the intention of the Government to fine their people for the lawless acts it was stated they had committed before they entered the colony; that they were to be disarmed and would be located across the Kei. This was a series of blunders; victorious over the Gcalekas, the colony could afford to act with generosity towards men who had probably erred from compulsion rather than intention.

Secondly. As already said, it is very much to be doubted whether a frank avowal of trust and permission to retain their arms would not have warded off any danger that was supposed to exist on that head.

Thirdly. By deciding to locate them across the Kei in the land of their old chief was to expose them to the chance of paying the penalty of having deserted him.

Mapassa, when summoned to pay the fine and to disarmament, consented without demur, but naturally objected to be re-established in Gcaleka land, urging that he had thrown himself into the arms of the Government in order to prove his loyalty, and desire to sit still, and that to send him back to his old country was to expose him to death at the hands of Kreli's followers. However he yielded, and as far as regards himself, there was no opposition to the orders of the Government.

With Mackinnon Umbala, it was different. He made, it is true, no objection to the surrender of arms or to the fine, but stated that he had long been in exile, and that he wished now to return to his own blood, and on leaving Kreli and refusing to take up arms he desired to rejoin his family and his people. This being contrary to the orders Mr. Fynn the agent had received, he informed Mackinnon that no difference could be made in his case, and that he must recross the Kei. Suspicion on the part of the Government engendered a like feeling in Mackinnon's mind, and found in this mood by disaffected men of the Gaka tribe it is hardly to be wondered at, that he believed an absurd story, that it was the intention of the Government first to disarm, and then to shoot him and that his people on hearing the same should take alarm.

The result was the flight of Mackinnon and his people to the Gaika location.

Orders were sent to arrest them, which was foolishly attempted with some show of forces and led to a collision between some of his people and the police. This exhibition of armed force confirmed Mackinnon in the idea he entertained, that the intentions of the Government were not honest. The error has been attributed to the police, but the fault lay in the first instance with the Government, and it is mainly responsible for the trouble that ensued.

Mackinnon's flight to the Gaika location was abetted by his brother Dimba, who covered his retreat with a party of armed men. The whole of the Gaika tribe were much excited; the war cry was sounded, and although Mackinnon eventually paid the fine, the fault committed was irreparable, and steps had to be taken to guard the frontier from a Gaika rising.

About the same time another event occurred, which had the effect of further complicating matters. A son of Dimba, named Namba, had hired a large tract of Government land in the East London district. He was informed that the lease of this land must be given up, as the Government was about to settle European emigrants on it. This was another blunder. It is well known, that the Kafir when once in possession of land considers that he has a claim to it, and has no idea of English law on that head. It is not difficult to understand, therefore, that happening at such a crisis this incident had a bad effect on the minds of him and his people, and helped to confirm any erroneous ideas that had got abroad as to the intentions of the Government.

These affairs have been dealt with at some length as they had a great effect in precipitating, by the bad faith they exhibited, the rising of the Gaika tribe.

VII.

RUNNING TIGER 41st BENGAL INFANTRY.

The following drawing and description of an apparatus for a moving target, designed by Colonel Obbard, commanding 41st B. I., and published with his permission, has been in use for some time on the range of the 41st B. I.; it is cheap, easily constructed, and has proved to be durable and effective, and is certainly, on the whole, the best I have seen in India.

W. MACKINNON, *Major,*
A. A. G. for Musketry.

SIMLA, 17th April 1879.

The frame work of the Tiger is made of the iron with which bales of cloth, &c. are fastened, and is supported by rods of iron (marked, a, a, a, &c. in the sketch) about $\frac{1}{2}$ inch diameter, rivetted to the frame work. The whole is covered with cloth and colored.

The carriage consists of a double row of planks, the lower row fastened cross wise to the upper, in order to prevent warping, and for the sake of strength and weight, to prevent its running off the rails. It is 5 feet long by 1 foot 5 inches broad, the wheels are of wood with an iron tire and flanges of iron screwed on the inner sides and projecting about $\frac{3}{4}$ inch. The flange is made of sheet iron $\frac{1}{8}$ th inch thick. There are three iron supports, (rods $\frac{3}{4}$ inch diameter) fastened to the carriage. On the centre one of these, the Tiger turns; the rod passing through holes made in the frame work of the Tiger, the upper hole is smaller than the lower and the rod is correspondingly smaller at the top, to prevent the Tiger resting on the carriage—the other two rods are to prevent the Tiger turning while running and to give support: there are two projections from the frame work of the Tiger and these are fastened to the front and hind rods by pins.

The rails are made of bar iron $1\frac{1}{2}$ inches wide and $\frac{1}{4}$ inch thick and are fastened to the sleepers and to each other as shown in the sketch. The rails are 1 foot 6 inches apart.

The sleepers are 4 feet long, 4 inches broad and 3 inches deep, they are tarred to protect them from the white ants and the weather, and are placed a yard from each other—their upper surface flush with the ground.

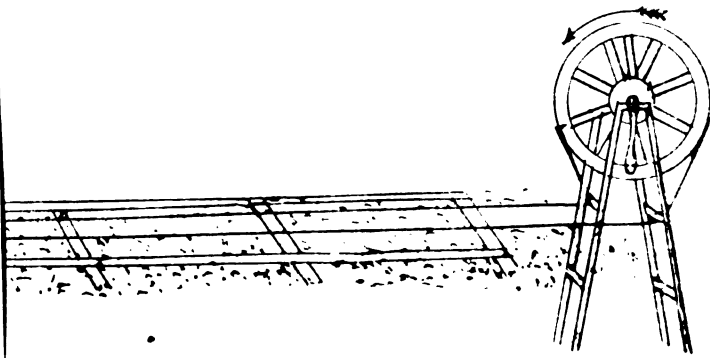
Cost.

The cost of making the above Tiger, carriage &c.
is as follows :—

					Rs.	A.	P.
Rails	...	...	...	...	38	0	0
Sleepers	...	...	...	...	29	12	6
Tiger	...	...	...	...	11	5	0
Wheel	...	...	...	...	7	0	0
Carriage	...	...	...	...	3	0	0
Rope	...	...	...	...	2	7	9
Labor	...	...	...	...	6	8	0

TOTAL Rs. ... 98 1 3

The railway is sunk so that no part of the carriage is visible above ground. The Tiger runs from the Marker's Butt on one side of the range to that on the other and is turned inside the Butt.



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Horse Fairs. cers from all parts attended these
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sowar's price, Rs. 200.

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VII.

NOTES ON THE PRESENT AND FUTURE SUPPLY OF
COUNTRY BRED REMOUNTS.

BY

LIEUTENANT COLONEL B. WILLIAMS,

5th Punjab Cavalry.

The horse supply of the future is one that calls for attention at the present moment from all those interested in the mounted branches.

I do not speak of the supply from our colonies, but will keep to the subject, of where country-bred remounts for Government, and Native Cavalry are to come from in the future, and means by which the furthering of that object may be effected. Let us first of all travel back to the years before the mutiny. Then the "Regular Cavalry" were supplied

The Horse Supply prior to the Rebellion.

with that first class horse the "Stud Bred," the less said, however, about his cost the better.

The Irregular Cavalry on horses of all sorts from the splendid mares from Mynpooree, and the districts around Meerut, to the horses of curious breeds and colors, picked up anywhere in the Punjab, which nevertheless did good work, and lasted longer than now-a-days. A fair percentage of rejected Stud bred, were also to be found in the ranks of each corps. How well these did their work, and how quality came to the front, any one can testify, who remembers the small sized leg that carried most of them.

Then came the Rebellion and a stoppage of the supply from Hindostan, and attention began to be called to the Punjab as a possible centre from which horses might be procured, and everything in the shape of a horse found its way into one or other of the newly raised

China and Abyssinia.

regiments. China and Abyssinia followed in due course, to both of which countries Bengal Cavalry regiments went, receiving on their return, horses to complete establishments, from the Government Studs—and I date it from that time, that the desire to have a better class of horse, first crept into our service.

Attention then began to be paid to Horse Fairs, and prizes were

Horse Fairs.

annually given for competition for classes. Officers from all parts attended these fairs, and

emulation commenced, larger prices were given than were before heard of, and in very few regiments began the remount to be bought at the sowar's price, Rs. 200.

Camps of Exercise were our next inducements to have good horses in our ranks, for, from being more seen, a desire to show to the best advantage arose. New blood began to appear amongst our Commanding Officers and Inspecting Generals, and a larger horse was often asked for. Were the 200 Rs. the sowar brings to the front on enlistment, becoming of more value all this time? Far from it; unfortunately all these years every thing had been gradually increasing in value, as well as horse flesh. Grain, land, and labor had all become more valuable, and horses and ponies had doubled in value. The large civil community. Horse flesh generally. had been steadily increasing its numbers, and given rise to a demand altogether out of proportion, to what it was before the Rebellion, while the troops kept up by the Native chiefs increased in number, and had better horses in their ranks than of former years. The formation of Studs had been begun of late years amongst them, which had during the last few years, taken away hundreds of fillies that would otherwise have come to us or remained in our provinces.

I should think the requirements of the Bengal, Punjab, and Central India Cavalry Corps, very nearly touched on 1,500 remounts annually.

Formerly we had the Horse Fairs down-country, Buteysur, Hurdwar, and one or two smaller ones. The sales of rejected Stud bred, and the indigenous Punjab horse, from which to draw our supply.

Now we have the same down-country Fairs with several new Punjab Fairs and the Punjab districts generally, from which to obtain our remounts. Horse breeding in the latter country has taken a great stride, and to the stallions imported, and the large amounts yearly offered as prizes, are the results due.

The largest Fairs are those of Buteysur, near Agra; Hurdwar, and Rawul Pindee. The smaller ones, Mukkinpur near Cawnpore; Umritsur, Bolunshur and Allyghur: Jhung, and Dera Ghazee Khan Trans-Indus, for the Biluch tribes; and Pokur near Ajmere for Kattyawars. The two first named Fairs, are held at places sacred to the Hindoo, and where tens of thousands annually congregate. Their presence there induces dealers and others to collect; besides this, Hindoo horse breeders, such as the Jât Sikhs, come with their horses in numbers. Years of scarcity affect the numbers assembling at these two Fairs greatly.

At Buteysur in 1874, upwards of 10,000 horses, it is stated, were collected. The number subsequently shown year by year, have gradually decreased to 5,927 in 1877; whilst the prices realized have steadily increased.

The contrary has been the case at Hurdwar, where from 1,399 horses shown in 1874, the numbers have gone up to 1884 in 1877, but fell this year to 1,318, owing to the large number that went away unsold last year, when the supply exceeded the demand.

At the Rawul Pindee Fair, we will begin in the year 1870. When 441 horses and mares were shown. The numbers have steadily increased, and in the spring of this year 2,288 animals were exhibited.

Out of this number, a large proportion were young stock, which will not be found at the fairs down-country; but the numbers indicate that the Fair is becoming more popular year by year, and a greater number of exhibitors are drawn to it.

From a report of the Dera Ghazee Khan Fair this year, I see that 1,112 animals were shown; 744 mares and 368 horses; a total far in excess of any previous year, which, considering its recent growth, speaks well for its popularity.

Umritsur Fair. The Umritsur Fair remains much as it ever was, a purely local and small assemblage.

Jhung Fair. The Jhung Fair this year offered less inducements than ever for buyers to assemble.

I notice in the Gazette lately, an alteration in the dates of some of these smaller Fairs, a move in the right direction, and which will increase their popularity. Formerly they clashed with the larger ones, and buyers had great difficulties in reaching them, except at great expense.

Taking all the Fairs into consideration, the number of new ones started in the Punjab, and the facilities offered to Zemindars, to have their mares covered by stallions located all over the country, I think

Increase of Horses in Punjab.

we may fairly assume that there are as many horses in the country, as formerly, and that the numbers are yearly increasing, whilst the improvements in quality and size is most marked. A horse that was considered good enough a dozen years back to carry a sowar, is not passed now.

A better description of Sowars horse now required.

We open our pockets, and purchase at an average above our Chuundah price, or we buy some good, and some bad, and keep it down, or we buy

fewer horses yearly, and our average age shows a pretty long tooth. On this account there will always be the cry of the difficulty of obtaining good remounts of the sort, fashion now demands. The horses in numbers will be there, but not to be bought by the dozen, of the stamp now required; for those the buyer must pick and choose, and travel hundreds of miles to get.

An outsider would say, how is it, that with the number of horses brought to these Fairs for sale, the requirements of the Cavalry cannot be met? I would answer, among the many you speak of are thousands of mares, each one the "proverbial goose," and over which the ægis of the Superintendent of Horse Breeding rests. To an anxious buyer how hateful are those forbidding brands, G. R. and B. M., but how dear they are to the above named official, who looks upon the possessors as his very own, secure from sale to the Remount Agent. But even he may go too far, and there is a limit, or should be one, which he should be debarred from crossing. Several thousands of mares now carry the brand, and in some districts nearly every mare does so. If this was persevered in, a real difficulty would arise, as I will show presently, of mounting our men. I hope therefore that in the districts still unvisited, the greatest care may be taken in selecting brood mares, and thereby debarring their use to the service. And I would further suggest that the propriety and otherwise, of removing, within a certain time, the embargo effected by branding, might be considered, and the present resources of the country would be available for our wants, whilst sufficient brood stock would remain to improve the prospective supply.

Most of us have travelled on the Grand Trunk Road, or on the line of rail in the Punjab; and many have I dare say noticed, the strings of colts, in batches of 10 to 20, tied head and tail, wending their way southward. These are mostly the produce of Punjab, Biluch, and Trans Indus mares, by Government stallions, bought up by dealers from around Agra and Delhi, and by the class of natives known as Bypariahs, who take them in strings as far south as Dinapore, ultimately to find their way to the Sonapore Fair, Calcutta market, and the Rajahs of Bengal. Those that are purchased by the dealers around Delhi, find their way as far down as the Nizam's territory. Thousands of colts in this way leave the Punjab yearly by the main road and by Ferozepore, and there is not a district or Tehseel, that is not looked up by these men, or their agents. I have met them in the villages under the Suliman Range, and one sees them in the outskirts of every Fair; men as a rule looking like grasscuts, and with no pretensions of dealers amongst them. A common price for them to pay for a full yearling, is from 70 to 90 Rupees.*

The Zemindars can hardly be blamed for this, as matters now stand. As soon as the entire colt is weaned, he becomes a nuisance to all about him. If kept, he has to be tied up and stall fed, so no wonder his quieter sister is given the preference, with the knowledge also of the various classes of prizes she can compete for at the Fairs. And he goes to form the strings of promising stock I have mentioned as leaving the country.

* This shows the necessity of Government bringing up young stock, and keeping them in runs till they are matured.

To remedy this evil, I see but one way, already instituted in some districts, and that is, to provide efficient salootries, who should be kept up at the head quarters of each district, on fair pay, and with a pony allowance. These men should travel in the district, and castrate all yearlings, reporting each case, to his District officer. In this way, one of the objections to keeping the colt would be removed.* A certain influence, commonly spoken of as "Sirkar ke hookm"—or "Sirkar ke merzi"—might also be brought forward by district officials, or some greater inducements might be held out, to induce Zemindars to keep their colts, and to give the cold shoulder to the wandering dealer.

There is no reason why the colts now bred in the Punjab, should not turn out, were this carried through, as well as the fillies.

Horse breeding will never be satisfactory here, or anywhere else, as long as the youngsters have no runs to stretch and harden their legs in. In each tehseel in every horse-breeding district there should be some "waste land" put aside for runs. It need not be pasture land, or of any great extent, but it should be in some central spot if possible, where under some arrangements, made by themselves, breeders should let their young stock grow up.

The Biluch appears to have found out already the value of their colts. In former years I believe they went through the idiotic custom of eating them, now they are setting an example to other, and more civilized tribes, by castrating them, and bringing them in to their Fair. Whether the "horse" will turn out as well as the mare, remains to be seen.

The better description of Biluch mare is certainly one of the nicest, and most hard working hardy animal we know; but whether the undersized, small behind the saddle, and fidgetty ones are likely to do well on our system with 14 stone on their backs, remains to be proved.

The number of remounts purchased annually by the Government Remount Agents are very few, I mean remounts of full age. In former years, when the trade with Caubul, was in full swing dozens of horses were purchased yearly for field batteries in Bengal, and the Frontier Force. I do not believe I am wrong in stating that a dozen have not been bought during the last six years, and the number of full mouthed horses purchased at Fairs, or in the districts, have been very few. A good number of yearlings and two-year olds, have been bought by the Government Remount Agent, and have been allowed to grow up, on the liberty system at Saharanpore; these have turned out very well, shewing the good effect-

* Since writing these notes I am told this suggestion is to be carried out.

ed by running loose, in distinction to the zemindar's stall fed business. Horse breeding must have time, and as years pass on, I believe looking at the good effected by the Stallions now in the provinces, a greater number of remounts from this class will be available; but more Agents should be employed, and more time spent in looking up youngsters, who should be located at the runs, I hear likely to be established in selected spots in the Punjab, and there allowed to grow up and harden. I would employ (as recommended by a Bengal Cavalry Commandant in a paper published on this subject some years back,) on these runs, selected invalided sowars, who, enjoying their pension, would gladly settle down on moderate pay, and look after and superintend the management of the young stock.

As breeding is at present carried on by natives, Government will never be able to purchase horses fit for their European Cavalry or Artillery. There will be sufficient horses to meet all the requirements of the Native Cavalry, if the officials of the breeding establishments will only be chary in the use of their formidable irons; and district officials will look after their colts. And lastly, if officers purchasing for regiments will bear in mind, that their men bring 200 rupees for a horse, and be satisfied with a fair horse at a fair price.

But if likely yearlings are purchased, and are allowed their liberty at Punjab runs, till they drop their colts teeth, I see no reason to fear, that the expense now incurred on stallions and the breeding establishments will be thrown away, but that it may in a partial manner be re-couped to Government by helping to mount our Hussars and horse our Field Batteries. If war were to arise on our border, where would the remounts come from; in a great degree they must come from the country itself. A fresh C. B. would be of greater use than a fresh Waler, easier broken in, and able to stand any variety of climate, or fodder he might have to live on, under circumstances in which the Australian would cut but a sorry figure. So I say, do not neglect your country-bred horse. Spend money judiciously on getting him, for he will pay his expense in the end, and will be of use to your army when the time comes.

The Punjab is par excellence the country for rearing horses. Grass and water are plentiful, and the soils are good. The Punjab, the country for breeding. Waste lands combining all these advantages are to be had. Of brood stock there is no scarcity. There might be more first class Arab stallions than there are; on these horses expense should not be spared, but the difficulty of getting them I know is great.

The above notes have been written by an officer who has served with the native Cavalry for upwards of 21 years; and who has travelled in most of the horse breeding districts and visited every Fair in India, in the hopes that they may throw some light upon the present and future horse supply of India.

August 1878.

UNITED SERVICE INSTITUTION OF INDIA.

NOTICE is here given that the subject of the Essay for the Institution Gold Medal, for this year, is "A Transport Service for Asiatic Warfare"

The terms of competition are :—

1. The Candidates must be Government Gazetted Officers.
2. The Essays must be legibly written, or printed, not exceeding 32 Pages of the Size and Style of the Journal.
3. The Essays must be forwarded to the Secretary on or before the 1st May 1880.
4. The Essays must be strictly anonymous, but each to have a motto, and be accompanied by a sealed envelope with the motto written on the outside and the name of the Candidate inside.
5. The Essays will be submitted for decision to three Referees chosen by the Council.
6. The successful Candidate will be presented with the medal at the Annual Meeting (if he be present), and his Essay will be printed in the Journal.

By order of Council,

A. D. ANDERSON, CAPT. R.A.,

Secretary, United Service Institution of India.

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The Council give notice that Life members to the Institution will be admitted on the following terms:—

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By order of Council,

A. D. ANDERSON, CAPT., R.A.,

Secretary, United Service Institution of India.

SIMLA. }
1st May 1879. }

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The Secretary will be happy to send an Index to volumes I, II, III, IV, V, VI and VII to any member wishing for the same.

A. D. ANDERSON, CAPT., R.A.,
Secretary.

ORIGINAL PAPERS.

III.

THE NORTH CHINA EXPEDITION OF 1860.

COMPILED BY CAPTAIN R. H. FAWCETT,
33rd Duke of Wellington's Regiment.

The following account of the expedition is chiefly taken from a report by an officer who was at the time Lieutenant Allgood and *D. A. Q. M. G.* through the campaign. The report has not before been printed, and as it contains much valuable information and the result of experience noted at the time, it was thought well worthy of publication. Time has however elapsed since the campaign, and events too well known to be recorded nineteen years ago are now forgotten, it has therefore been necessary to weave into the report so much narrative as would connect the whole campaign into one progressive account. For this "The narrative of the war with China in 1860" by Lieut. Colonel Wolseley *D. A. Q. M. G.* to the Force and "The narrative of the North China Campaign in 1860" by Robert Swinhoe, who was Staff Interpreter during the campaign to Sir Hope Grant, have been drawn on. The details of the troops composing the expeditionary force from India were kindly supplied by the Adjutant General.

Among the chief points of the provisions of the Treaty made with the Emperor of China in 1858, were these; that a representative of *H. M.* the Queen of Great Britain should reside at Peking, and that no obstacle or difficulty would be made to his free movements. Also that the ratifications of the treaty under the hand of *H. M.* the Queen of Great Britain and of *H. M.* the Emperor of China should be exchanged at Peking in one year from the day of signature (June 26th 1858). The French had made a similar treaty with China. When however the British and French flotilla, conveying the ambassadors to Peking for the purpose of ratifying the treaty, attempted to ascend the Peiho River, a treacherous attack was made on the ships from the Taku forts, which are situated at the mouth of the river. Three gunboats were sunk, and the ships had to withdraw with some loss. This occurred on the 25th of June 1859. So gross an insult to the national flags could not possibly be submitted to, and the British and French Governments entered into an alliance for the purpose of enforcing, if necessary, by arms, the stipulations of their respective treaties. It was agreed that

an English army of about 10,000 men and a French force of 7000 should be despatched to China. The latter went direct from France, our's was sent from England, the Cape of Good Hope and India, the bulk of the force from this latter place. The following is the statement of the troops that proceeded from India.

<i>Bengal.</i>	<i>Madras.</i>	<i>Bombay.</i>
7-14 R. A.	A. Co., 5th Battn. Arty.	3-13 R. A.
8-14 R. A.	1st Supplementary Arty.	31st Foot.
22nd. Co., R. E.	Co.,	3rd N. I.
1-3rd Buffs	A. and K. Companies Sappers and Miners.	5th N. I.
2-60th Rifles	21st. Native Infantry.	
67th Foot		
87th Fusiliers		
99th Foot.		
1st. Regt. Sikh Irregulars (Probyn's) now 11th Bengal Cavalry.	(now 19th Bengal Lancers)	
Fane's Horse.	(now 15th Sikhs).	
Regiment of Ludhiana.	(now 20th P. N. I).	
8th Punjab Infantry.	(now 22nd P. N. I).	
11th Punjab Infantry.	(now 23rd Pioneers).	
15th " "	(now 27th P. N. I).	
19th " "	(now 7th N. I).	
47th Native Infantry.	(now 10th N. I).	
65th " "	(now 11th N. I).	
70th " "		
	<i>Troops not from India.</i>	
	1st K. D. Gs.	
	1st (Royals) Foot.	
	2nd (Queens) Foot.	
	44th Foot.	

The greater part of the Expeditionary Force from Bengal left Calcutta during the latter end of February and the month of March 1860.

The sailing vessels reached Singapore, on an average, in 28 days, and Hong Kong in 57 days.

The Cavalry ships, 13 in number, were towed to Hong Kong. The 10 steamers which towed them carried infantry, and made Hong Kong in about 30 days.

The majority of the sailing vessels had a light breeze as far as the straits of Malacca. Thence to Hong Kong the wind was very variable and capricious, and frequently blew hard. Some of the vessels were towed into Singapore, and for some miles out of that place, by Hill's War Steamers.

Not less than two full months should be given in calculating the passage of sailing vessels from Calcutta to Hong Kong, at this season of the year.

The troops reached Hong Kong in good health : a fact which may be attributed in a great measure to the liberal space allowed them on board ship, and to the supply of fresh vegetables which was put on board each ship at the instigation of Sir R. Napier. They suffered more or less from cholera in the Hooghly, but the epidemic left them when fairly at sea. The heat in the straits of Malacca and at Singapore was a good deal felt, especially by the horses.

The casualties amongst the horses averaged 3 per cent up to Hong Kong.

At Hong Kong the troops were landed, and placed in camp ; the greater portion of them at Kowloon, the main land opposite Hong Kong. The remainder were landed at Deep Water Bay and at Stanley at the back of the island.

The health of the troops remained good during their stay in camp. The climate was cool and pleasant.

Some of the horses were landed with mange ; others had irritation of the skin and appeared in low condition. They recovered their appearance rapidly. The fodder supplied to them consisted of paddy straw and the straw of the ground nut, both of which are extensively used at Hong Kong.

They reached Talien Bay in much better condition than could have been anticipated, and were fit for work in a day or two. The green food which could be procured there in abundance very soon brought them into good condition. The casualties between Hong Kong and Talien Bay were trifling as the weather was cool, when finally re-embarked for service their condition was most satisfactory.

The ration for Native troops and followers authorized in general orders dated Hong Kong, 3rd May, is here given. It was generally approved of.

						lbs.	oz.
Rice or Flour	...	...	...	...	...	2	0
Dhall	...	...	...	...	...	0	4
Ghee	...	...	...	...	...	0	2
Salt	...	...	...	...	...	0	$\frac{3}{4}$
Firewood	...	...	...	...	...	2	0
Turmeric	...	...	...	...	...	0	$\frac{1}{8}$
Pepper	...	...	...	...	...	0	$\frac{1}{8}$
Sugar	...	...	...	...	...	0	3
Good Mutton, twice a week	...	...	...	...	...	$\frac{1}{2}$	0

On board ship they drew in addition :

Onions	...	...	...	...	...	...	$\frac{1}{4}$
Garlic	...	...	...	...	...	...	$\frac{1}{4}$
Tamarinds	...	...	...	...	...	...	$\frac{2}{2}$
Chillies	...	...	...	...	...	...	$\frac{1}{4}$

"Tobacco $\frac{1}{2}$ oz may be substituted for sugar by those who prefer it. As a general rule rice in lieu of flour on alternate days to Bombay and Madras Troops, and twice a week to Punjabees. Rum to be issued to Madras Sappers, and Rum, Opium, and Tea to the Punjabi Troops on payment, 2 Drams of Rum to be the maximum daily."

From experience the only alterations which Lieut. Allgood would make in the above Ration would be to give $1\frac{1}{2}$ lbs. of Rice or Flour instead of 2 lbs. and to increase the mutton to 1 lb twice a week, and to give rum and tobacco gratis. Meat was not uncommonly given in lieu of ghee when the latter was not forthcoming. The privilege of purchasing rum was generally taken advantage of by the Sikhs, who were latterly permitted to buy it oftener.

The means of fitting out an expedition at Hong Kong, in regard to shipping, commissariat &c., are considerable. Labour is very plentiful, and artisans of almost every description can be procured. Within the last few years the resources of the places have greatly increased. At Whampoa large boats for embarking and disembarking Troops and horses were built.

No localities exist on the island of Hong Kong for encamping troops in large numbers. Kowloon was leased from the Chinese Government for that purpose and has been ceded to the British Government in the convention signed at Peking. The ground is undulating and has good natural drainage, nor is it shut out from the wind as the town of Hong-Kong is. Water is sufficiently plentiful if looked after. 8,000 men and 1,000 horses may find encamping ground there.

The French expedition had its rendezvous at Shanghai. The ponies for their Artillery, and for the few cavalry they had brought with them from France, were bought at that place and at Manilla.

The British Land Transport consisted of the Chinese Coolie Corps, (which eventually numbered nearly 3000 men) of ponies from Manilla, Shanghai and Japan—of bullocks from Madras, and last, but by far the most efficient, of some 600 trained mules from Bombay with their drivers. Some excellent waggons and Maltese carts may be added, a portion of which were landed at Tiensin, and were used by the army on its march to Peking.

The Coolie Corps was a decided success. It had been organized during the expedition to Canton and had been recently strengthened. It was commanded by Major Temple of the Madras Army, and under

nim were officers and men of different Regiments. It had a semi-military organization.

Mr. Robert Swinhoe, who was Staff Interpreter to H. E. Sir Hope Grant during the campaign, says of the Coolie Corps: Cantonese coolies were hired in numbers to form a Corps for the transport of the munitions and stores of the army. These men were each to receive the large sum of nine dollars or £ 1 17s. 6d. a month, besides two suits of clothes and rations. Notwithstanding the high rate of wages offered, it was found difficult to obtain as many as were deemed necessary, or any but the scum of the population; because a strange rumour had got afloat among the Chinese, that in all the fights they were to be thrust forward to receive the brunt of battle, while the British, being well sheltered behind, would be able to fire away at the enemy without harm or danger to themselves. No amount of persuasion could convince the majority of the pig headed natives that we only desired the coolies as carriers. The fact of their all being dressed uniformly, and frequently drilled, with their bamboos over their shoulders, by the sergeants appointed from various regiments to control the incoherent mass, presented to the minds of the populace positive proof that the term "coolie" or porter was merely a blind. This however, though a difficulty at the time, did not really effect the efficiency of the Coolie Corps; for Colonel (now Sir Garnet) Wolseley gives the following testimony, "Upon all occasions during the war, whenever there was hard work to be done, these Cantonese coolies were ready and willing for it, working away cheerfully."

The Coolie Corps was uniformly clothed in Chinese jackets and trowsers, the feet being bare. On the jacket both before and behind, was inscribed, within a black circular line, the number of the individual, and that of his company immediately below, with a black line separating the two. Their pigtailed heads were surmounted by bamboo caps of a somewhat flattened conical shape, with the letters C. C. C. signifying Canton Coolie Corps, painted conspicuously in front. The officers of the corps were mostly drawn from the Royal Marines, but the regiments of the line also contributed a few. The British officers and soldiers so appointed were at once distinguishable by two narrow white stripes running down the sides of their trousers. A few of the better class of coolies who could speak a little English, were promoted over their country-men to the rank of lance corporals, corporals and sergeants; and in such cases one arm of their loose jackets was marked with one, two, or three white chevrons according to their rank.

Allgood says—The ponies bought in Manilla were under sized, weedy and unfit for baggage purposes. Those from Shanghai Shantung ponies, were sturdy and excellent. The ponies brought from Japan were inferior in strength and build to the Shantung ponies, but fiery and of good blood.

The Bombay mules reached Talien Bay after a voyage of about 3 months in excellent order. There were few or no casualties on the voyage as they had been shipped with care, and properly attended to.

The pack saddles, or pads sent with them, should be used on all expeditions as they never break and seldom give sore backs. We tried pack saddles from Manilla, and Japan, and made others up at Hong-Kong on approved patterns. None, however, were good except the Indian pad.

No care appears to have been bestowed in shipping or looking after the ponies brought from other places. In some instances 50 per cent. were lost on short voyages, and in most instances the animals landed, were in such a wretched state that many had to be shot. None were fit for work. In some ships, and after landing, glanders made sad havoc. The miserable state of our ponies when subsequently landed at Pehtang was witnessed by every one. The prices paid for them were exceedingly high. It would have been cheaper had our whole land transport been shipped from India.

He strongly recommends that whenever land transport ponies or mules leave India, one man for every two ponies should be sent with them. Experience in China (where forage is plentiful) has convinced him that it should be so. Bombay furnishes the best men for the purpose. Mules stand the sea voyage well, but whether mules or ponies, they should be shipped in separate stalls and well attended. The drivers employed in the North of China, consisted of Indians, Manilla men, Chinese and others. The Military Train under whose orders they were, were unable to talk to them.

NOTES REGARDING NATIVE TROOPS ON FOREIGN SERVICE BEYOND THE SEA. *Lieut. Allgood's Report continued.*

It is desirable that Native Regiments proceeding on Foreign Service, should be composed of either Sikh's or Muhammedans, and not of mixed classes and castes, where the prejudices of one sect interfere, on board ship, with those of another. Muhammedans and Sikhs both cook regularly on board, and are not so particular about trifles of caste as Hindustanis are. The latter should not be sent on foreign service when the others are available, as their prejudices are obstructive.

Establishments.

The following establishment should accompany an Infantry Regiment.

- 20 Cooks or Sangrees.
- 10 Bhisties.
- 5 Pukalies.
- 2 Sweepers per ship.*

* These sweepers should be attached to the Hospital on landing.

- 1 Moonshee.
- 1 Moollah or Gunttee (as the case may be)
- 2 Tin men.*
- 1 Lohar Mistree.
- 1 Moochee.

Adjutant's and Quartermaster's Clerks.
 Dhobies and Kalassis *useless*.

The Hospital establishment should consist of :

- | | | |
|-------------------|---|---|
| 2 Native Doctors. | } | Doolie bearers should not be sent to <i>China</i> .
2 Doolies per company should go. |
| 2 Bhisties. | | |
| 2 Cooks | | |

Kit and Clothing,

The native followers should embark with the same Kit as the soldiers viz :—

- 1 Waterproof Valise (marked with the man's Regt. and number.)
- 1 Winter Cloth Suit.†
- 1 Puttoo Coat.
- 1 Pair of new American drill khaki trousers.‡
- 1 English Great Coat.§
- 1 " Blanket.
- 1 Sheep skin Posteen.
- 2 Flannel Shirts.
- 1 Pair of Cotton Drawers.
- 2 Pair of Woollen socks.
- 2 Pair of ammunition boots (English).
- 2 Turbans.
- 1 Waterproof sheet $6 \times 1\frac{3}{4}$ feet.
- 1 Haversack.
- 1 Water Canteen.
- 1 Small lota and brass plate.
- 2 Tin Cases of blacking and 1 small brush.

The undermentioned articles should be carefully stowed away (in the event of its being summer) in the valise and not undone till required viz :

- | | | |
|---|---|--|
| <ul style="list-style-type: none"> 1 Cloth suit. 1 Flannel Shirt. 1 pair of drawers. 1 " of socks. 1 " of boots. 1 Case of blacking. 1 Turban. | } | To be left at the depôt on disembarking. |
| | | |

* Material for tinning should be made over to the Quartermaster before embarking.

† The winter suit might probably be dispensed with, in Egypt or Persia and an extra pair of Khakee trousers given in lieu.

‡ A second pair of old ones may be taken for use on ship board.

§ Country great coats, boots, or blankets should on no account be given to troops proceeding on Foreign Service. The Afghan Choga might advantageously be substituted for the great coat with all Native troops as it is at least a couple of lbs. lighter.

The soldier should embark with his usual marching kit and dress viz :

Puttoo Coat.
Khakí drill trousers.
Flannel shirts.
Socks.
Ammunition boots.
Great coat and blanket (to be rolled up in the waterproof sheet with $\frac{1}{3}$ of a Tent d'abri.)
A stout serviceable haversack.
Water canteen.

The haversack should have a division inside in which may be stowed away the round tin of blacking and blacking brush.

The soldier should not be allowed to wear his shoes and socks on board-ship except when parading.

A couple of canvas frocks, and one water proof cape per 3 men should be given for wear on boardship.

No hammocks are required.

A few spare massaks and pakals should be shipped.

Ammunition.

Ammunition at the rate of 200 rounds per man, inclusive of 60 in pouch, should be sent with regiments. Any further supply should go in Military storeships. The ammunition should, for convenience of carriage, be made up in cases of 800 or 850 rounds each, and salitas for ponies should accompany.

Cooking utensils.

Should, to secure uniformity, be made up in magazines on an approved pattern, capable of compact packing suited for half companies, or perhaps sections. One mule or pony should be able to carry the cooking utensils, fowrahs, bill hooks and axes of a company.

Superfluous Clothing.

During the Campaign of 1860 the native soldiers embarked at Calcutta with a great quantity of superfluous clothing, pots, pans &c.,

These as a matter of course were never landed, and were probably thrown over board. Not one single article of clothing in excess of what has been above laid down, with perhaps the exception of a pair of light trousers expressly for ship board, should be permitted on board. The men should have timely notice to sell such extra kit before they embark.

Tents.

No where except in India can heavy tents be used in a campaign.

During the campaign of 1860, in China, bell tents only were used, 14 men were allowed to each tent. To each tent was given three water proof sheets, 1 spade, 1 bill hook, and 2 tin cooking camp kettles, 98 or 100 lbs. in weight in all.

The Commanding officer	1 Bell Tent	
Other Field officers	1 "	} Two tents could be carried on 1 mule or pony.
Medical officers	1 "	
Officers of each Company	1 "	
Regimental Staff	1 "	

A few large tents might be sent for Hospitals in a standing Camp. Where transport is scarce the carriage of tents is a heavy item. Native troops should I think, always carry their tents d'abri both in India and abroad. As long as European soldiers have to carry their Knapsacks, Bell tents should be supplied to them. The tent d'abri is sufficient to protect the soldiers from night dews and pitched under shade does well enough for day work. Bell tents should be given to native Regiments for their Hospital at the rate of 3 per Regiment and tents d'abri for guard tents.

4 fowrahs, 2 bill hooks, and 2 hand axes per company should be sent with Regiments on service, and on land should be carried with the cooking utensils as recommended above.

Officer's Servants.

2 Servants for Field officers, and one for other officers, not including syces. The Quarter Master should take a horse, Army Divisional and Brigade Staff 2 horses each.

Mess Cooks and a small proportion of servants should accompany Regiments.

Medical (see also Hospital)

Two Medical officers should accompany a Native Regiment.

Instruments, medicines and small boxes of medical comforts should be in portable trunks fitted for mule or pony carriage.

Mosquito curtains were not required in the north of China.

European Regiments.

The only native establishments that should accompany European Regiments on Foreign service are Bhisties and Cook boys at the rate of 2 each per company and 2 each for the Hospital. The English tin new pattern camp Kettle should be sent if possible, as they are lighter than the Indian cooking boiler and require no tinning. Bell tents only at the rate of 14 men per tent.

Bill hooks, hand axes and spades at the same rate as recommended for Native Regiments, doolies and masaks, but no doolie bearers to China.

Irregular Cavalry.

10 or perhaps 15 per cent of grass cutters should accompany on foreign service, these men should be "Umedwars," who might be brought on the strength of the Regiment as sowers on casualties occurring.

2 spare sets of horse shoes (for the forefeet) with a double supply of nails should be taken by each man.

1 horse blanket, a blanket and great coat, and posteen, and a warm suit of clothing with 1 pair of ammunition boots, should be in the possession of each man on embarking.

2 light pakals per troop with a pony for each pakal should be sent with the Regiment.

Horse Transports.

The following is a précis of the contents of the report of Major Probyn, with whose views it was understood those of Captains Fane and Cadby coincided.

Horse ships should not have false decks unless they are properly caulked. Should have large scuppers to carry off the urine. Should have low ports if possible. Great attention should be paid to the ventilation, if the voyage is to be in warm latitudes. The horses should be on the main deck. The stalls should be 7' long and 2' 6" wide, from centre to centre of stanchions, with a space of 3' 6" or 4' in rear of the stalls to enable the men to clean the horses properly. To effect this it

may be necessary to diminish the space between the row of stalls on the opposite side of the ship. The height between the planking of the decks should never be less than 7'. The iron pegs for fixing the side boards should be attached to the stanchions with a short chain, otherwise they are frequently lost. There should be a strong bamboo 15" below the upper one. Cross battens should be placed directly beneath the side boards made so as to allow the urine to run off. The feeding troughs should have strong fixings as they get rough handling. There should be 10 per cent of spare stalls on long voyages, 25 per cent only of resting slings, 6 shipping slings in each ship; 1 scraper per stall 50 per cent of brooms, with a reserve.

Coir mats are most useful, but should only be used in rough weather as they are liable to stink and become full of insects if not taken up. Hay-nets 1 per each horse.

A horse requires 6 gallons of water per day in hot weather, in cool weather 5.

Oats are superior to gram, the latter frequently causing gripes.

Chloride of zinc should be freely and frequently used.

The men's apartments should not be bulk-headed off from the horses. They should be white washed once a week and the horse deck every 10 days.

Land Transport.

Great waste of life occurred amongst our land transport animals in China. The manner in which they were shipped (an exception is made to those sent from Bombay) and the wretched condition in which they remained until the end of the campaign in spite of the abundance of forage always available, may be attributed to the following causes.

1st. The Military Train, under whose immediate supervision the animals were placed, were unaccustomed to look after them, and ignorant of fitting and looking to their gear. The syces were composed of Indians, Manilla men, and others, and with few exceptions, could neither understand nor be understood by the officers and men placed over them. The syces were wretched, and uncared for, and as a natural consequence, the animals were neglected.

2nd. The faulty pack saddles gave the animals sore backs, little attention appears to have been paid to fitting them. The only good pack saddle was the *pad pack saddle* sent with the mules from Bombay. It can be injured with difficulty, seldom gives sore backs, and is easily repaired.

3rd. The fittings of the ships which carried the ponies were often flimsy. The ponies were stowed away like sheep. In one vessel from

Japan 75 ponies perished by the fittings having given way in a gale. To judge by the condition of the ponies brought from Manilla, Japan &c. but little care can have been bestowed on them during the voyage.

4th. There appeared to be little or no system in the management of the transport animals.

Should an expedition be again sent to China, Persia, or Egypt, the land transport should all go from Bombay and a special corps organized composed of efficient men.

The officer selected to command, as well as those under him should be specially chosen on account of their activity, knowledge of the treatment of animals and also of the vernacular. Their pay should be such as to secure the best men. Intelligent privates from Dragoon Regiments, men with a good knowledge of the vernacular, smart and attentive should be placed over the syces and drivers as non-commissioned officers, in the proportion of 1 Non-Commissioned officer to 20 syces. A similar number of intelligent natives, as Jemadars, should assist the Non-Commissioned officers.

1 syce should be embarked with every two mules or ponies.

The Corps should be divided into divisions, sub-divisions, &c. and a regular system of internal economy and control established. The Non-Commissioned officers should be armed with hunting whip and revolver only; and should be mounted on ponies.

The Commanding officer should be alone responsible to, and under the orders of the principal Commissariat officer. The Corps should be organized, and in working order before it embarked. The Non-Commissioned officers and men should be practised in fitting saddles, loads &c. picketing and other useful work.

Surplus saddles and all kinds of gear should be sent with the Head Quarters of the Corps and a staff of Mochis, and blacksmiths &c.

The ships should be strongly and carefully fitted, and the animals should be daily groomed, and attention paid to their food and watering. Each animal should have a separate stall, otherwise in bad weather there will be much loss amongst them.

In China we used light English-built four wheeled waggon and Maltese carts. In countries where the roads are tolerable they are considered preferable to pack animals, are more economical and easily loaded.

Each waggon was drawn by 4 mules or ponies and carried 1,500lbs. Each cart was drawn by 2 ponies, and carried from 800 to 1,000lbs. The harness should be of the simplest and stoutest materials.

Cattle Transports.

The mortality amongst the slaughter cattle and sheep brought to Talien Bay for the use of the army was excessive, often one-third of each ship load died on the voyage, and the remainder were so poor, as to be unfit for use.

From enquiries Captain Allgood learnt that both sheep and cattle on boardship, require *special* care, in respect to their diet and watering, and recommends that when sheep and cattle are shipped by the Commissariat, competent ship's butchers be placed on board to look after and attend to them at whatever price the services of such men may be obtained.

The troops were constantly arriving at Hong Kong in transport-ships during March and April, at which time of year the climate of Hong Kong is salubrious. They were encamped at Kowloon, a rocky promontary which stretches out from the mainland towards Victoria. At Hong Kong itself there is little space for encampment of troops. The French troops collected at Shanghai.

It is almost needless to state that, previous to this, every effort had been made by diplomatic arrangement to avoid the necessity of war and to induce the Chinese Government to tender an apology, restore the guns, material and ships abandoned and to allow of the provisions of the treaty of 1858 being carried out. These efforts had failed and an ultimatum was sent on the 8th of March—with the usual result in such cases. The British Minister (Lord Elgin) was informed through the Chinese Commissioner that his language was insubordinate and extravagant, and that for the future "he must not be so wanting in decorum."

By May the preparations were completed and the British Army for the campaign was organised as follows:—

1st Division—Major General Sir John Michel. K. C. B., Commanding

1st Foot (Royal.)
 2nd Foot (Queens.)
 31st Foot.
 60th Foot (Rifles).
 15th Punjab Infantry.
 Ludhiana Regiment.
 Lieutenant Colonel Barry's battery, R. A.
 Captain Desborough's battery, R. A.
 Lieutenant Colonel Fisher's Company, R. E.

2nd Division—Major General Sir R. Napier, K. C. B., Commanding.

3rd Foot (Bufs).
 44th Foot.
 67th Foot.
 99th Foot.
 8th Punjab Infantry.
 19th Punjab Infantry.
 Captain Moubray's battery, R. A.
 Captain Govan's battery, R. A.
 Major Graham's company, R. E.

Cavalry Brigade. Brigadier Pattle, C. B., (Commanding.)

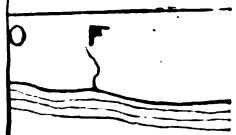
Two Squadrons 1st King's Dragoon Guards.
 1st Sikh Cavalry (Probyn's Horse).
 Fane's Horse.
 Captain Milward's battery R. H. A.

There was also a battery of mountain guns manned by Madrasis and about 250 Madras Sappers and Miners and a small siege train with Major Pennycuik's company of Royal Artillery.

The total strength amounted to 14,000 of all ranks.

The plan of operations for the commencement of the campaign was to form a rendez-vous in the Gulf of Pechili, so that when all preparations were complete the allied armies might make a simultaneous attack upon the forts on the Peiho. The French were to take their position at Chefoo on the Southern promontory, where there was a small bay affording tolerable anchorage, and the province was known to be rich in cattle, of which, and of draught animals in particular, the French were much in want. But the place was too small for both armies, fresh water being scarce and the bay too limited in extent for the immense fleet. Previous reconnaissances had noted two places suitable for the British Army, Wei-hai-wai and Talien-wan (wan signifying bay). Of the two the latter was selected, and as Talien bay, it is generally mentioned in the records of the campaign. One reason for selecting these places was, that on the coast near Taku, the ice in winter prevents all approach for several months, but at Chefoo and Talien bay where there was deep water, no ice impeded the navigation, these places were accordingly fixed upon, and depôts of stores eventually formed at them.

On the 15th of May troops commenced to re-embark for the North. The first Division of the Fleet (some 20 ships) sailed on the



the hill sides. Kin-Chu, a walled town on the Gulf of Pechili, is but 3 or 4 miles distant from the top of Hand Bay and is the residence of the local Mandarin. By occupying it simultaneously with Talien

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On the 15th of May troops commenced to re-embark for the North. The first Division of the Fleet (some 20 ships) sailed on the

19th. The Naval authorities anticipated a fair wind and a rapid passage, but they were out of their reckoning. Rough weather and foul winds were experienced, and instead of making Talien Bay in 10 or 12 days the quickest passage was 20. The average was 30. The 2nd Division was detained at Hong Kong for several days owing to foul winds.

Up to the end of July the climate of Talien was cool and agreeable. During June, east winds prevailed, and the days were frequently cold and foggy. Rapid changes of temperature took place; an east wind blew, and warm clothing was required; 24 hours afterwards, it blew from the south or south west, and the coolest clothing sufficed.

Talien Bay is situated at the most southern promontory of Liatung, and at the northern entrance to the Gulf of Pechili. The Bay is very extensive, open only to four points of the compass in a south east direction, it consequently affords good and safe anchorage in nearly all weathers. The English Fleet, of above 200 sail, occupied but a small portion of it. The Fleet watered at Odin Bay, Bustard creek and Victoria Bay. After considerable labour the wells at the first named place afforded a daily supply of nearly 200 tons of water. Bustard Creek was also made into a good watering place. Victoria Bay did not give more than sufficient to supply the troops after they had been landed. The Fleet could not have filled up with water, if the troops and horses had not been landed. The cavalry and artillery were encamped at Odin Bay, the 1st Division on the Victoria Bay side, and the 2nd Division at Hand Bay. The land transport ponies, generally at Bustard creek. Water was found in sufficient quantity for the troops without indenting on the reservoirs used by the ships. On the West of the Bay it was found close to the surface in almost every ravine.

Green forage is abundant in July and August. Wheat ripens about the middle of the former month; at the commencement of the latter, Indian corn breaks into ear. Millet and Beans of different kinds abound, and probably ripen at the latter end of September or beginning of October.

The coast rises well above the sea, in places it is abrupt and rocky. Ranges of hills rising to a maximum height of perhaps 1000 feet (with the exception of Sampson's Peak, which exceeds that elevation) divide and merge into undulating plains covered with rich crops. Cattle were frequently seen in large herds on the hill sides a few miles inland. Sheep appeared scarce. Poultry and vegetables were latterly brought into camp in considerable quantities. The mules and ponies are fine, and the donkeys numerous.

Fuel is scarce. In a few places small fir plantations are seen on the hill sides. Kin-Chu, a walled town on the Gulf of Pechili, is but 3 or 4 miles distant from the top of Hand Bay and is the residence of the local Mandarin. By occupying it simultaneously with Talien

Bay, and throwing a few troops on shore, we should cut off the end of the promontory, and be in a position to enforce the sale of whatever mules, cattle, &c., we might be in want of. The influence of the Mandarin on our first arrival prevented our being supplied with anything.

Talien is well fitted as a place of rendezvous for an expedition about to operate in the North of China. It is within 30 hours steaming of the mouth of the Peiho, and affords, in the summer time, plenty of green food to set up horses and cattle.

Our Hospital ships were spacious and comfortable; there were 5 for the Europeans, and one for the Natives, and were calculated on an average to hold 150 patients, respectively.

Symptoms of scurvy appeared amongst the 19th P. I., and amongst the Chinese Coolies. An improved ration was given to the Coolies and their health was restored.

Lord Elgin and suite arrived in the "Feroze" on the 9th of July.

It was intended that when our allies had completed all their preparations, the two armies, leaving behind them their dépôts of stores at Che-foo and Talien Bay, respectively, should sail northward upon the same day, and effect a landing, the French at Chi-Kiang-ho, twenty five miles South of the Peiho, the English at Peh-tang about ten miles north of the river mouth. The landing of the armies accomplished, an advance was to be made upon the position round the mouth of the Peiho, simultaneously by both, the French attacking the forts upon the north bank of that river. But during the stay in the gulf of Pechili, the French Navy having made a careful reconnaissance of the coast near Chi-Kiang-ho, found that there was not sufficient water for their vessels, and that consequently it was necessary for them to land at Peh-tang with the British troops. After several conferences it was finally settled that both forces were to start on the 26th of July. The two armies were to meet at a point, to be indicated by one of our men of war, twenty miles south of the latitude of the Peiho.

On the 21st of July the transport animals were embarked from Talien and the various corps put their heavy baggage on board ship. On the 23rd all the cavalry and artillery were embarked, with the exception of Fane's Horse, which went on board the following morning, when also the remainder of the army embarked.

At the dépôt at Odin Bay, there were left four Companies of the 99th Regiment, 417 of the 19th Punjab Infantry, 100 of the Royal Artillery and 6 guns, besides 200 sick and weakly Europeans and 100 sick native soldiers. Before leaving, provision was made for the accommodation of 440 sick Europeans and 500 sick natives, with stores of medicine, medical comforts &c., for that number. On the 25th of July the ships were employed in getting into the positions assigned for them;

and on the 26th the fleet weighed anchor and sailed from Talien Bay. The sailing vessels were towed out of harbour, and left to find their way as well as they could. There was a favorable breeze enabling the vessels to sail in their allotted places. On the morning of the 28th the Fleet joined that of the French, 20 miles off the Peiho, and cast anchor. On the 30th the sailing vessels were towed to within six miles of the mouth of the Pehtang-ho.

The outline of the coast as seen from the ships was low and indistinct; the only objects that could be clearly made out were the lofty cavaliers and bastions of the Taku Forts.

The following is the copy of the memorandum for the order of landing, omitting the detail of the distribution of the corps in the various ships. This may be found at length in Swinhoe's book p. 50.

HEAD-QUARTERS, S. S. GRANADA,

Gulf of Pechili, *July 19th, 1860.*

General Memorandum.

The disembarkation of the troops will commence on Tuesday next, the 31st instant, according to the following arrangements:—

Every man will land with three days cooked provisions, fifty-six rounds of ammunition, great coats, canteens, water-bottles full and haversacks. They will wear cloth trowsers, summer frocks, worsted socks and wicker helmets.

The men who proceed in gun boats to the shore will have on their great coats folded, with canteens attached.

Those in regular troop boats, great coats folded with canteens attached, not on their backs.

It must be borne in mind, that under whatever circumstances the troops land, it is necessary that they form quickly and regularly at once. Officers will therefore caution their men (and set the example themselves) that there must be no rushing from the boats, which always causes hurry and confusion, and risks the ammunition becoming wet; the soldiers should be distinctly told that their ammunition and firelocks must be kept dry.

Every boat will have the proportion of officers belonging to the men in it, and if possible the commanding officer and adjutant should be the first to land.

The force will land in the following order; and it must be clearly understood that soldiers receive orders, and obey them from Military officers only.

1st.—The 2nd Brigade 1st Division, with artillery as detailed, will disembark at a place to be hereafter pointed out, to be ready to leave the vessels at day light on the 31st instant. (Here follows the detail.)

2nd.—The 1st Brigade 1st Division will disembark next.

Further orders will be given as to remainder of the men and horses of Desborough's and Barry's batteries. Neither baggage nor tents will be landed with the 2nd Brigade.

Immediately after the 2nd Brigade 1st Division leaves its vessels, dhoolies, with their bearers, spare ammunition and coolies will be landed.

It is essential that every thing belonging to the soldiers should be placed in a safe place on board the vessels previous to landing, and the masters of transports instructed to have all articles carefully placed in the boats when sent for. One Non-Commissioned officer and a few men to remain in each vessel for this purpose.

By order,

(Signed) KENNETH MACKENZIE,

Deputy Quarter Master General

A fresh breeze and a chopping sea prevented the landing taking place on the 31st. About 4-30 P. M. on the 1st of August a party of about 200 English from the 2nd Brigade 1st Division, and an equal number of French soldiers were landed about 2,000 yards below the Fort of Pehtang. The troops had to wade through mud ankle-deep for about three quarters of a mile.

The landing was effected without opposition. The object in landing at this point was to attack Pehtang from its rear, thus turning the defences. By six o'clock a brigade was landed and towards sun-down the causeway leading from Pehtang to Sinho was struck. There were at Pehtang two forts, one on each bank to cover and defend the entrance to the river. The forts however, compared with those at Taku, were badly built and no boom or stakes closed the river. The entire country outside Pehtang is more or less over-flowed by the tide for 2 miles. The causeway is raised about 2 feet above high water level and is about 12 feet in breadth. The troops bivouacked on this causeway and a picket of 100 Rifles and 100 French held the town gate of Pehtang. As the high tide came up, it over-flowed the mud on both sides of the causeway and on its receding the stench was almost intolerable. The troops suffered much from thirst. The exertion of dragging through the mud with rifle, ammunition &c. for a mile or so, had been very great and the water bottle each man carried contained a very small amount for troops who had been fed of late on salt provisions. About midnight the Coolie Corps brought in a supply of water from the gun boats in



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breakers. It was ascertained during the night that the town of Pehtang had been abandoned by the enemy, and the town and fort was occupied the next morning.

The position of Pehtang is naturally one of great strength and the Tartars certainly committed an error in not strengthening it and holding it. According to a letter (taken at Sinho) from the Chinese Generalissimo, Prince San-ko-lin-sin (familiarily termed by the British soldier Sam Collinson) to Peking, no great importance was attached to our capturing Pehtang. He says "should the Barbarians take Pehtang they cannot occupy it from want of water, besides it is most difficult to debouch from, and my cavalry will surround and destroy them if they attempt it." Allgood says that Pehtang has a population of probably 25,000. Its principal streets are wide enough for guns but desperately deep in mud and filth in rainy weather. At first sight the town appears poor, but on examination many excellent houses were found evidently belonging to wealthy merchants. The extensive marine store shops and pawnbrokers argued a wealthy mercantile town. Large quantities of grain and fodder were found in it. The river near the town is about 300 yards in width. Our gun boats and despatch boats lay within 20 yards of the bank at high tide. The existing wharfs were of the rudest description and it was necessary at once to construct others. Several yards of wooden wharfing ready for use had been brought from Hong Kong.

The chief difficulty lay in supplying the troops with drinking water. The supply found in the huge earthen jars which every house possessed was wantonly wasted, and only lasted for two days. A condensing ship at work in the river landed 40 Tons daily. As the numbers increased on shore, water was eventually brought down daily in two large water-boats from 6 or 8 miles up the river where it was found perfectly fresh. The animals were constrained to drink the river water at low tide, but did not relish it.

The disembarkation of the whole of the troops and stores continued during the first ten days of August. The towns-people had gradually cleared out of the town as we occupied it, and eventually none remained. The Allies numbering fully 13,000 soldiers, 5,000 followers and 4,000 animals were packed to overcrowding in the wretched dirty town. There as elsewhere in China, the furniture, rafters, door, windows &c. of houses afforded an ample supply of fuel. The British troops were kept always busy; fatigue parties were regularly employed repairing the roads, making wharves, carrying water or landing stores. Looting was sternly repressed. This was not the case with the French, and the capture of fowls and pigs was carried on briskly by them. Wolseley says, one cause of this desultory foraging on the part of our allies was, that upon landing each man was supposed to have with him six day's provisions, which is more than any man can or will carry. If he should keep his biscuit it is the most that he will do, but no soldier will carry and take care of six day's salt meat. It grows bad and smells

horribly after the first two or three days, when it is invariably thrown away. The Frenchman was thus obliged to go pig hunting or actually fishing, to keep himself alive, a system of supply which relieved their Commissariat of much difficulty. Our men on the other hand, landed with only three day's provisions, including the rations for the day on which they landed, and on the fourth, regular supplies of food and drink were issued to them.

On the morning of the 3rd a reconnaissance under the command of General Collineau, consisting of a thousand French and as many English, moved out along the raised causeway leading to the Taku Forts. They ascertained that the causeway ended three miles, ahead, and that some works defended the approach to Sinho. Some 10 or 12 men of the Allies were wounded without much information having been gained. The Chinese of course scored it as a great victory, and it was probably one of the conducing causes to the firm demeanour of the Tartar troops when our advance took place.

On the 9th a reconnaissance of about 200 cavalry and 100 infantry went out; the infantry held the causeway to protect the cavalry, who left the causeway and made a circuit to the right and ascertained that the country in that direction was practicable for all arms. The party returned without firing or being fired at.

On the afternoon of the 9th and throughout the 10th there was very heavy rain, and though it cleared up a little on the 11th, and the ground dried rapidly, there were still considerable doubts as to the practicability of an advance on the 12th.

However at 5 A. M. on the 12th of August the Army commenced to debouch from the gate of the town. It required no little arrangement to extricate by one causeway a large force so closely jammed up.

The 2nd Division led the way followed by all the cavalry. This column under the command of Sir Robert Napier left the causeway about 1,000 yards beyond the gate, and took ground to the right, for the purpose of operating on the enemy's flank. The guns, after leaving the causeway stuck frequently in the deep mud, and got on with much difficulty. Three ammunition waggons stuck immoveably, imbedded deep in the mud, and were not brought to the front for some days. The guns to which they belonged, went on with their limbers only. As the advance proceeded the ground became drier and more favorable.

The 1st Division, under Sir J. Michel, with the entire force of the French with the respective Commanders-in-Chief moved along the causeway directly towards Sinho. By 10 A. M. the last of the Allied Army had left Peltang.

The Tartars held Sinho, having advanced detachments holding the works commanding the direct road, and on their left flank about 1,000 yards to the west of Sinho, was a large camp, principally of cavalry.

When the 2nd Division had advanced about 3 miles from the causeway, line of battle was formed with the cavalry in echelon on the right, covering the flank in that direction. Fifteen guns soon opened on the Tartar cavalry, who having formed several irregular lines of skirmishers, advanced very steadily towards our troops. For a short time they disregarded the fire of the guns and came on in scattered parties till close to our cavalry, when with a loud wild yell they charged in the straggling manner of undrilled brave men. The Sikh irregular cavalry (Fane's horse) met the foremost hand to hand, and the consequent rout was complete. The pursuit was vigorous for the time, only ceasing when the horses of the cavalry were completely blown. As they had been travelling through deep mud, had lately come from on board ship and had not galloped for months, the wiry hardy ponies of the Tartar cavalry carried off the greater number of their riders. Major Probyn supported by the British cavalry followed them up for some five miles and captured 200 ponies and a large flock of sheep. The loss of the enemy amounted to about 60 or 80 killed. The greater part of them fled panic-stricken through Sinho towards Tanku.

Whilst the 2nd Division were thus engaged the 1st Division and the French had moved steadily along the main causeway towards the enemy's works or entrenched camps in front of Sinho. On coming within about 1,400 yards of these works the ground on each side of the road became sufficiently firm to move over; so the English infantry deployed to the right, the French with a small number of sailors and marines doing the same to the left. Thirty six field guns (French and English) were brought to bear against the advanced entrenched work. At the termination of the causeway the country became higher and drier, and the guns were enabled to advance by alternate batteries to within 300 yards. The works were abandoned after the enemy had suffered some loss. Sinho was covered by an entrenchment, but was not defended.

After two hours halt the whole of the French troops supported by the 60th Rifles and the 15th P. I. advanced along a causeway towards the entrenched village of Tanku. On coming within range the enemy opened fire along his entire line of works. On either side of the causeway there were deep ditches and marshy ground, so that the attack by this route could only occur along the narrow road commanded by the enemy's guns and there was no practicability of deploying for the attack. A reconnaissance having been effected, the force withdrew and the Allied armies bivouacked at Sinho.

A few days after this some prisoners were sent in by the Chinese, two English soldiers and some Cantonese of the Coolie Corps. It appeared that these men, with others who were killed, had loitered a long way in rear of the 2nd Division, and were suddenly attacked and made prisoners by some of the Tartar cavalry which had extended beyond the flank of the English cavalry.

The village of Sinho has a population of about 6,000. It is situated within one mile of the Peiho, from which a creek, navigable at high tide for junks of considerable size, runs. In this creek some 30 junks were secured, which were afterwards used to form part of the bridge of boats. The country round Sinho, especially on the west, is more favorable for military operations than that around Pehtang. Extensive gardens supplied our troops with vegetables from the 12th to the 30th August. Large stacks of hay sufficient for 3,000 animals, for 15 days, fell into our hands. Green fodder was abundant, and good grass was to be had in large quantities at the distance of one mile on the west of the village. The Peiho water was quite drinkable, and much better than was found in the creek, where it stagnated. Fuel was obtained in plenty from the houses in the village. The Army bivouacked in and around Sinho on the night of the 12th.

On the afternoon of the 13th the 1st Division took up ground on the South of Sinho with its right resting on the Peiho. At night a working party of 700 men, with a covering party of 500, threw up cover within 500 yards of the Tanku entrenchment.

On the morning of the 14th the 1st Division under Sir J. Michel, with its right resting on the Peiho, and a similar force of French, with its left resting on the Tanku causeway, advanced to attack Tanku.

Previous to opening fire on the entrenchment a party of sailors burnt some armed junks enfilading the advance, and from which and from a small mud battery behind them an annoying though harmless fire had opened.

The English and French field artillery was deployed into line in front of the Infantry, bringing 36 guns (12 of these were "Armstrong" guns and did great execution) and 2 Rocket Batteries to bear simultaneously on the entrenchment. The trench dug on the previous night was occupied by our riflemen. When the guns had advanced to within 300 yards an entrance was effected, at the bastion which abuts on the river, by some of the 60th Rifles, who had crept up to it under cover of long reeds which fringed the river.

The enemy fought their guns bravely, as was testified by the dead bodies lying around them. Near the gun in the river bastion, 17 dead bodies showed the destructive effect of the two Armstrong guns which had been playing on it. The extensive entrenchment around the village of Tanku was won without further fighting. The loss of the Allies was slight. The village of Tanku had a population estimated at from 3,000 to 3,500.

Thirty good junks were secured, and were subsequently floated up the river to form the English portion of the bridge of boats.

The enemy had a bridge of boats near the Tan-yamun, but broke it on our capture of Tanku.

Previous to attacking the Taku forts it was necessary to bring up the heavy guns, ammunition, and supplies from the rear. The transport coolies and animals were worked day and night. Numbers of the latter had died on our first march from Sinho; every hour they fell exhausted on the road never to rise again. In a week's time not more than half were able to move a mile, three-fourths had sore backs.

On the 16th of August, an unusually high tide caused by a strong wind from the sea, caused the Peiho to overflow its banks, and to flood the ground on which our camp stood.

On the 18th some French troops crossed the Peiho opposite Sinho and drove the enemy out of some gardens and villages, throwing their out-posts on to an open plain from whence they could see the great road to Tiensin. The opposite bank of the river having been thus secured, material for constructing a bridge was brought up from Pehtang. The construction of the bridge was effected half by Frenchmen and half by Englishmen.

The Peiho river averages about 250 yards in breadth from its mouth up to Sinho; the tide runs with great velocity when a wind blows from the east.

The gardens occupied by the French detachment on the right bank of the river deserve mention. They are very extensive, covering perhaps an area of three or four hundred acres. Grapes, peaches, apples, pears, apicots and other kinds of fruits and vegetables of almost every description grow in the richest profusion. The four first-named fruits were on the point of ripening, and were greedily devoured by the Troops.

The position of the French troops across the Peiho was by no means a secure one until a regular bridge had been constructed. The capture of the Taku Forts was the present object in view, and it was strongly urged by the French General that the attack should be made first on the forts on the right, or Southern bank of the river. In support of this view it was argued that the movement would cut off all possibility of the retreat of San-ko-lin-sin and the Tartar troops by the broad road to Tien-sin, and that any of them who crossed the river to the north side would be cut off by our cavalry.

Sir Hope Grant, supported by Sir Robert Napier, differed from General Montauban, and considered it advisable to attack and capture the forts on the Northern side first. For, from observation of the position, it was thought (as proved to be the case) that the defences of the Northern were weaker than those of the Southern forts, and yet that with the great Northern fort in our hands, we should be able to look into and enfilade the whole length of the great Southern fort and take all the sea defences of the Northern forts in reverse. The attack on the Southern forts was a brilliant conception and no doubt, if successful, would lead to very great immediate results. But

the attack on the stronger forts would cost more lives, and the whole allied force consisted of less than 30,000 men, while the force of the enemy, especially in cavalry, was immensely larger. The allied army would be broken up into two parts, because it would be necessary to keep up communication with Pehtang and the fleet, which was the real base of operations from whence provisions and ammunition were drawn. On the day that the army advanced from Pehtang, the Tartar cavalry had been able from its superior force to manœuvre round the army, get between it and Pehtang, how much more easily could they do this if the bulk of our forces were despatched across the river. If we attacked the Southern forts as proposed, without previously capturing the Northern forts, we should leave on the left bank a force that might operate at any moment on our rear, and also give the enemy a *point d'appui* on that bank, to which they might transport as much of their force as was available for service in the field.

Eventually General Montanban, not however without protest, conceded to these views, and the plan of attack was arranged on the Northern forts. Sir Hope Grant had determined on not making any onward movement until a *depôt* of supplies, sufficient for the army for 10 days, had been collected at Sinho, and the heavy guns and engineer's park brought to the front. By the 20th of August all was in train for the attack, and a road had been constructed over the great salt flat which extended to the north and west of the nearest northern fort and stretched round most of the fortifications of Tanku. Bridges and causeways were thrown over the numerous canals which intersected the flat.

The construction of the bridge over the Peiho proved to be no easy matter and entailed a considerable delay; it was not completed till four days after the attack on the northern Forts, and when finished was not suitable for heavy guns. The difficulties arose from the Peiho being a tidal stream with soft muddy banks, and although boats were procured in sufficient numbers, yet much labour had to be expended in procuring anchors and collecting other material. For rough anchors, in such cases, large stones are much employed, but the country produced no stone of any kind, the only article of this kind obtainable being a few mill stones from the villages and some of the enemy's heavy shot.

On the night of the 20th August batteries were thrown up for our heavy guns to cannonade the nearest northern Fort. At daybreak on the following morning, after a very heavy cannonade from land and sea, the near Fort was carried by escalade by the Allies. The British loss amounted to about 200 killed and wounded, and the French to nearly the same number. The Tartars stood well and lost very heavily. The northern fort at the mouth of the river capitulated, the garrison surrendering themselves as prisoners of war. A magazine in each Fort was blown up during the cannonade.

At 2 P.M. of the same day a violent thunder storm accompanied by very heavy rain laid the entire country under water. It ceased at 6 P.M.; but rained again lightly during the night. The entire country was under water for some hours.

All the Forts on the Southern bank were abandoned the same night. Allgood says that it was hoped that a Division of Infantry, and the cavalry, which were lying idle at Siuho, would have been thrown across the Peiho and placed on the Tien-sin road previous to the attack on the Forts. Had this been done, he is of opinion that the whole garrison of the Taku Forts must have become prisoners of war.

The strength of the Forts from the land side lies principally in the nature of the country surrounding them. The land is low and intersected everywhere with broad and deep dykes up which the tide runs. These dykes all require bridges across them. Added to these difficulties the country is impassable for guns after heavy rain, becoming a perfect swamp. The Fort which was taken by escalade was closed in its rear with earthwork of the most solid description, the inner part of the parapet being further strengthened by massive blocks of upright timber. Two ditches each about 25 feet in breadth surrounded the fort, except where it rested on the river. Bamboo stakes, firmly fixed in the ground and charred and sharpened at their points covered the space intervening between the two deep wet ditches and the wall, and proved a difficult obstacle. Men falling down from the scaling ladders were impaled on the stakes.

The stakes and booms across the mouth of the river were rapidly though not without difficulty, removed by our gunboats, and the navigation of the Pei-ho was thus opened to our sailors. On the 23rd August the Admiral went up to Tien-sin with some English and French gunboats. The keys of the town were made over to him by a deputation of the principal people.

The 67th, a battery of Armstrong guns with their horses, and the 1st Royals followed on the 24th and 25th. Lord Elgin and Sir Hope Grant went up on the latter day.

The bridge of boats was finished on the 24th. The town from which the Taku Forts take their name is situated on the right bank of the river near the large South Fort; Tanku and Siku adjoin it. The whole town is commonly known by the name of Taku, and probably has a population of 20,000. At ordinary times supplies of all sorts are procurable. A market was established outside the South Fort the day after we occupied it, to which sheep, fruit, poultry, and vegetables were brought for sale. The people, who during the panic had fled from the town, flocked back in a few days, and confidence was thoroughly restored.

Had the entrance to the Pehtang-ho been defended as the Peiho was the capture of the Forts would have been a most difficult enterprise.

The cavalry with Sterling's Battery marched for Tien-sin on the 25th up the left bank of the river, the infantry moved by the right bank, crossing the Peiho at the bridge of boats at Sinho.

The French marched on the same day up the left bank.

At Taku, Tien-sin, Pekin, and throughout the country generally, a large wheelbarrow is used by the people to convey their goods and chattels from place to place, especially in and around large towns. Those wheel-barrows are seen in great numbers both in Taku and Tien-sin. One man, sometimes two, act as leaders. In this way a weight of 240lbs. was carried, marching daily, between Tien-sin and Pekin. Carts drawn by mules and ponies are abundant everywhere between Taku and Pekin. They are sometimes drawn by as many as 4 mules or ponies, one in the shafts and three abreast, as leaders; the largest description of cart easily carried 800lbs.

The mules and ponies of the country are remarkably fine and strong and well adapted for cart or gun draught. They are numerous throughout the valley of the Peiho. At Pekin only, did we see camels in any numbers. They were very fine ones, resembling the Cabul camels in appearance and stature. During the march of the troops the gun boats were busily employed in carrying stores of all kinds to Tien-sin. The voyage was sometimes performed in 8 hours.

The advance guard of the 1st Division arrived at Tien-sin on the evening of the 2nd of September, the main body on the following morning, and encamped on a large grassy plain on the South of the town.

The 2nd Division reached Tien-sin on the 5th. The French were encamped on the North side of the river.

During the halt of the Allies at Tien-sin supplies of every kind, including sheep and cattle were abundant. The most delicious grapes and peaches could be bought in the market at a low price, and huge blocks of clear ice were hawked about the camp, and bought for a few cash.

At Tien-sin, as at Sinho, bell tents were often unpleasantly warm during the day time. The Indian tents which had been brought from Hong Kong were issued to the troops in lieu of bell tents a few days previous to our advance on Pekin, but were left behind when the march commenced. The French Army used their tentes d'abri throughout the campaign. Earthworks on a gigantic scale had been thrown up round Tien-sin. The two forts built below the town on the right and left bank of the river were similar in construction to the Taku forts.

The town of Tien-sin is built on the right bank of the Peiho, in the angle formed by the junction of that river with the "Yulian-ho" or grand canal. This is also called the Yu-Ho. A brick wall some 30

feet in height, now old and crumbling encloses the town, which has four gates. Extensive suburbs exist on the north, the east and west of it. The population (including suburbs) is probably 150,000.

Some of the streets, are paved ; and all the principal ones are wide enough for carts to proceed in single file, but will not admit of their passing each other except in a few places.

The grand canal is little less in size than the Peiho. The latter in Tien-sin does not exceed 80 yards in width. The road to Peking leads across the Canal by a bridge of boats.

The suburbs between the grand Canal and the Peiho form the strongest point in Tien-sin for military occupation.

The Peiho, the Grand Canal, the When-ho and the smaller Canal which runs into the Peiho between the two last named ones, were crowded with junks of all shapes and sizes.

On the left bank of the river, below the town large quantities of salt were stacked. The huge piles of it extended for fully a mile in length, and several hundred yards in depth. The only Canal which, branched from the Peiho between Tien-sin and Taku was one a few miles below the former place. It was wide enough for small junks and led in the direction of the Pehtang-ho. During the early part of September the country on the south of Tien-sin was covered with crops of Indian corn. From the 1st of September the nights become cooler and the dews heavier. During the day time the sun was warm, and on one occasion a hot wind blew from the south-west. The heat however during August or the earlier part of September was never such as to distress the troops or prevent their marching at all hours. The baggage of the Army had been all landed from the ships and placed in the South Taku Fort. Such as was required was being brought up, when the sudden move of the Army took place from Tien-sin, where there had been much negotiation and expectation of the conclusion of the war. The troops were in their summer clothing, the same they had landed in, and only carried either a great coat or blanket when they moved from Tien-sin on Peking. When the cold weather set in, some warm blankets were brought up from the rear and given to the troops.

On the 7th September the Army was ordered to advance on Tang-chu it being found that the Chinese Commissioner was unauthorized and that the negotiations proposed were only a scheme to get possession of the person of Lord Elgin, the Ambassador, and his suite.

It was hoped that an immediate advance of our troops towards Peking would have the effect of bringing the enemy to the required terms of peace. The rumour current on our arrival at Tien-sin, viz : that San-ko-lin-sin had been degraded by the Emperor and sent off in disgrace to his estates on the Amoor, was no longer circulated. He had

now regained the Imperial favor, and was determined to oppose our advance on Peking.

On the morning of the 8th, two Regiments of Cavalry, 1½ Batteries of Artillery accompanied by a small force of Infantry marched from Tien-sin and encamped at Si-ku on the far bank of the When-ho. On the 9th Sir H. Grant and Lord Elgin followed, and on the 10th some French troops.

A large portion of our transport had been taken from Regiments to enable the Commissariat to carry grain for the Cavalry; consequently when the advance of more troops was ordered a requisition had to be made on local resources. The flight of the Imperial Commissioner and of the Governor-General of the Province from Tien-sin, had caused a panic in the town, and compelled us to seize carriage. Many of the cart drivers, coolies, and wheel-barrow men absconded during the first march.

The country we were about to move through was very favorable for military operations. The road as far as Tang-chu lay near the bank of the Peiho, which was navigable throughout for junks of small draught, hundreds of which could be seized at Tien-sin for the conveyance of our stores and material. No advantage however was taken of this mode of transport until our land transport had been found utterly insufficient for our requirements.

Every inch of the country was covered with crops of Indian corn, millet, beans &c. Cavalry in almost any number might have subsisted on the resources of the country, and required no provision from the Commissariat.

The 2nd Brigade 1st Division with Probyn's Horse, a Battery of Artillery, and a company of Engineers under Sir J. Michel left Tien-sin on the 13th and closed on the Commander-in-Chief on the 16th at Ho-si-wu, 42 miles in advance of Tien-sin.

Previous to Sir J. Michel's arrival at that place, it had been arranged between Lord Elgin and the Chinese Commissioner (a fresh one had been sent down to re-open negotiations) that the Allied force was to halt short of Tung-chu in a place to be pointed out by the Chinese authorities, from whence Lord Elgin was to proceed to Peking for the purpose of ratifying the treaty.

The Allies marched to Matow on the following day, and on the 18th, when on the march towards Tang-chu, they came on the Tartar Army entrenched in a position commanding the road, five miles beyond it.

The Allies numbered about 600 Cavalry, 20 guns, and 2,500 Infantry.

It is here necessary to mention that Mr. Parkes and Captain Loch (Lord Elgin's private Secretary) accompanied by Colonel Walker, Asst. Quarter Master General of the Cavalry Brigade, a Commissariat officer, Mr. Bowlby the "Times" Correspondent, and an escort of 20 Sowars, with three or four Dragoons under the Command of Lieut. Anderson of Fane's Horse, had preceded the Army from Ho-si-wu in order to arrange some matters connected with diplomacy, the collection of supplies, and the encampment of the Allies.

While waiting until the baggage had been packed in a compact form half a mile in our rear, the Governor General of the Province approached, under a flag of truce, with a letter for Lord Elgin (who had remained at Ho-si-wu). Being unable to give a satisfactory explanation relative to the large force in our front, he was sent back to his own camp. On a sudden a musketry fire ran down the enemy's line, and Colonel Walker, Assistant Quarter-Master General, accompanied by the Commissariat officer alluded to above, two dragoons and 2 or 3 sowars, were seen galloping in hot haste towards the Allied Force. Treachery had shown itself; some of them were wounded: all had a narrow escape of their lives. Mr. Parkes who had ridden back with them from Tang-Chu (where the party had passed the night) had returned thither to demand an explanation of the Mandarins relative to the armed force and Mr. Loch had brought in a note from Mr. Parkes previous to the act of treachery above related, and had immediately returned to endeavour to extricate Mr. Parkes. Captain Brabazon, Deputy Assistant Quarter Master General of Artillery, accompanied him, and was amongst the number subsequently murdered. Of all who fell into the enemy's hands, Messrs. Parkes, Loch, a French officer, 3 or 4 privates and a few sowars only were returned to us alive.

No sooner had the enemy shown their hostile intentions than they drove in our pickets, and forced us to make immediate dispositions for attacking them.

The French with a squadron of Fane's Horse advanced against the enemy's left. A village slightly in advance of the centre was occupied by two companies of the 99th supported by two or three other companies of that Regiment and 400 Marines, to prevent the enemy from breaking our centre. A Battery of Armstrong Guns, the 15th P. I. and the bulk of our Cavalry were held in readiness to advance directly on the left flank of the enemy, as soon as Sir J. Michel with one squadron of Probyn's Horse, three Guns, and the 2nd Queens had gained possession of a village which lay on the enemy's right flank, on which were drawn up the greater part of his cavalry. Both flanks of the enemy's defensive position were turned. Our left flank was greatly overlapped by the hordes of Mongol Cavalry, and the small force of cavalry which we opposed to them did not allow Sir J. Michel to follow up his success until reinforced by more cavalry from the centre. The enemy's Cavalry was pursued for 4 miles at a brisk pace. Meanwhile our centre advanced rapidly against a village in the centre of the

enemy's entrenched line, and pushed the enemy's routed troops through Chang-Kya-wan, destroying several camps a mile in front of it. The British found quarters inside the town. Our Allies encamped two miles short of it.

Seventy-seven Guns were the fruit of this victory. The enemy's loss was considerable on his left and centre where he had placed the greater portion of his Infantry.

Chang-Kya-wan is a small town surrounded by a very dilapidated wall. The road runs through a large suburb, and crosses a small stream by a stone bridge at the entrance to the town. It probably contains a population of 10,000. Immense stores of brick tea ready packed for the Russian market, were found here. Its value was estimated at £250,000. Small junks ascend the stream from the Peiho as high as the town.

Previous to our advance the French had received a re-inforcement of a Battery of Artillery, and some Infantry from Ho-si-wu, and the British a convoy of provisions.

On the 21st the army again advanced. The baggage was all parked two miles beyond the town under a strong escort. At about one mile and a half further on, the enemy's cavalry was discovered. Our Infantry had been marching in mass of columns with the Cavalry on their left, and the French on their right, and on emerging from a grove, the head of the column had hardly time to deploy and the guns to open fire before the Mongol cavalry had charged down on them. A few rounds emptied several saddles; and our cavalry advancing, seized the opportunity of making a most effective charge. The country was unknown and in places considerably wooded. The tall minaret of Tang-Chu was visible, and bore N. W. by N. at about four miles distance. Fortune favored the Allies. The disposition for the attack would have been nearly the same had accurate maps of the locality been possessed. The enemy's line was thrown back on the Canal, and their communications with Peking by the nearest route threatened. The allied line was necessarily much extended so as not to be over-lapped by the hordes of Mongol cavalry. The French struck the canal at the Pa-li-Kao bridge (from which General Moutauban took his title) on the paved road leading from Tang-Chu to Peking, and the British right at a lock, a mile and a half above it. The left of the British with the whole of the Cavalry pushed the enemy towards Peking, burning several large camps within 6 miles of the Capital. Forty-three Guns fell into the hands of the Allies, and no less than 1000 of the enemy, and a vast number of horses strewed the field of battle. The Mongol cavalry numbered not less than 15 or 20,000. The victory was decisive, and Peking lay open to the Allies. The baggage was brought up before evening, and the camp pitched; the French at the Pa-li-kao bridge, and the English at the lock on the Canal above mentioned.

The large town of Tang-chu is built on the right bank of an affluent of the Peiho, the latter river taking a more northerly direction a short distance below the town. A wall, in tolerable repair, 15 feet thick, and from 30 to 35 in height, runs round the town measuring nearly five miles: the parapet has been worn down by age, and time has cleared away all traces of a ditch. There are five gates, there is also an outlet for water in the angle between the two gates on the south face (its height 9 feet, and width 7) a wooden palisading only preventing access and egress from the town. In many places the suburbs lie close up to the town walls, under cover of which the walls may be approached. The gates, as at Peking, are built some 6 feet within the archways, and would afford cover to a party adjusting powder bags to blow them open. The outer one being blown open, a gun might easily be run inside the court to blow open the inner one, a few riflemen keeping down the fire from the wall.

The brick revetment of the wall is two feet thick at the top; inside the masonry is earth. Ramps leading on to the walls are only seen at the gateways. The principal streets of the town are paved and are wider than at Tien-sin. The houses are not built so closely, and a large space is taken up by the public granaries, which are enclosed by a wall about 18 feet in height.

Judging from appearances, the population of Tang-chu is about the same as Tien-sin.

The paved road to Peking, averaging 18 feet in width, leaves Tung-chu by the west gate. It crosses the canal at the Pa-li-kao bridge and enters Peking by the Chao-yang Gate. It is paved with huge slabs of stone, but is in such bad repair that it is unfit for laden carts.

The branch of the Peiho, on which Tang-chu is built, is 20 yards in width. The Peiho where it leaves it, is perhaps 30 yards in width. Small junks come up to Tang-chu. Our siege guns, materials, and stores of every description were brought up by the Peiho route. Boats with fifteen inch draught made the passage in 5 or 6 days, and returned in three. The junks in which our siege guns (68 pounders) were shipped drew 18 inches, made a longer passage, and met with difficulties. A company of Engineers accompanied them and cut the boats out whenever they grounded. Between Tien-sin and Yang-tsun large boats find no difficulties.

There is a wide Canal between Tang-chu and Peking, but boats must unship their cargo four times, the locks being so constructed that they cannot be passed.

Superfluous water is carried off the canal into the Peiho by a sluice at Tang-chu. The former is several feet above the level of the latter. The nearest road from Chang-kya-wan to Peking leaves the Pa-li-kao bridge about 2 miles to the right and enters the capital on the south side. Cart roads intersect the country in all directions.

On the departure of the Army from Tien-sin the Indian corn was still standing. Beyond Ho-si-wu (where it ripens somewhat earlier, the soil being lighter and drier) we found it all cut. The aspect of the country underwent a marvellous change.

During previous marches no cavalry could have left the road, but beyond Ho-si-wu the country was a vast open plain, free from all obstacles. Forage was everywhere abundant, our horses and transport animals between 3 and 4,000 in number subsisted for 14 days on the forage within the pickets.

It is worthy of note that a large force of cavalry may campaign in the valley of the Peiho between August and the 1st November without the least aid from the Commissariat. The horses became accustomed to Indian corn and millet seed and thrived well.

From the 22nd September until the 2nd of October the army halted near Tang-chu awaiting the arrival of re-inforcements, siege train, ammunition, and commissariat stores. Sir R. Napier joined the camp from Tien-sin with the 67th Regiment, the 8th P. I., a company of Engineers and Madras sappers. The 60th Rifles came up from Ho-si-wu on being relieved by the 31st from Tien-sin.

The places held by us between Tien-sin and Tang-chu were as follows:—

Yang-tsun	{ Dett. Irr. Cavalry. 2 Co's of Infantry. $\frac{1}{2}$ Battery of Artillery (English)	
Ho-si-wu	Dett. Irr. Cavalry. 8 Co's of Infantry. 2 Co's of Infantry. (French)	} A general hospital was formed here and a large Commissariat Dépôt.
Chang-Kya-wan	Dett. Irr. Cavalry.	

Tang-Chu was held by 2 guns and 400 marines.

During the night of the 29th and 30th rain fell. A cold wind set in from the north and brought with it a perceptible change of weather.

Two or three reconnaissances had been pushed up to the gates of Peking on both sides of the canal, and it had been ascertained that no force lay between us and the city.

It was subsequently ascertained that the Emperor had fled to Giho in Tartary on or about the date of our action at Chang-Kya-wan. Our intelligence was however very defective, and led us to believe that he was still at his summer Palace of Yuen-ming-Yuen. Letters from Peking, under flags of truce arrived constantly in camp.

On the 2nd and 3rd the siege guns having arrived, the British Army crossed the canal by a bridge of boats, and by a bridge made

at the lock, and encamped at $1\frac{1}{2}$ miles on the Pekin road, where it had been determined to form a depot of stores and baggage,

The 1st Royals arrived in Camp on the night of the 4th.

On the 5th the Allies advanced towards Pekin, the British leaving their tents and baggage at the depot. The French, who had come up with their baggage from Pa-li-kao- bridge, were fagged on reaching some brick-kiln's two miles from the north-east corner of Pekin, and induced Sir H. Grant to halt there for the night. These kilns formed an excellent position for the French depot, as they were capable of defence by a small body of troops, and afforded a large supply of water. The British left their Knapsacks there.

The enemy were said to be entrenched on the North of the town inside an embankment.

Early on the 6th the Allies moved forward to attack the enemy in their supposed position. The French on the left, and the British on the right, the cavalry moving round on the Yuen-ming-Yuen road so as to intercept the enemy's retreat.

On discovering that the position was vacated, the French moved direct on Yuen-ming-Yuen, which was five miles distant on the north-west of the city at the foot of the hills, and were joined by our cavalry near the summer Palace.

The British occupied the suburbs in front of the Te-shing-mun (gate) of the city, throwing forward their pickets within 500 yards of the walls.

A few horsemen were the only enemy seen throughout the day 1,700 sheep were captured in the suburbs. The country round Pekin was found more thickly wooded than any we had moved through.

The Palace of Yuen-ming-Yuen was thoroughly gutted on the following days. Everything of value that could be carried off, consisting of gold, silver, clocks, watches, enamels porcelain, stones, silks, and embroidery with numerous other articles of vertu, were removed by the Allies.

The Palace grounds cover a large extent, and are enclosed by a substantial Park wall. They are laid out with great taste. artificial water, canals, rock work, grottoes, pagodas, hills and valleys beautifully wooded with cedar and fir trees delight the eyes, the picturesque scenery varying at every turn of the winding pathways.

The town of Hai-tien lies on the South of the Palace. The entrance to the latter was guarded by two colossal bronzelions. A wide road leads from the Si-Chyh-mun (gate) of the city direct to the Palace.

The Emperor passed nearly all his time at his favorite palace' seldom residing in Pekin, except when his attendants compelled him to do so.

The nights were becoming cold, and the troops, who were all wearing their summer clothing, received some warm under clothing and blankets soon after our arrival at Pekin.

On the 8th Messrs. Parks and Loch, a French officer, four privates, and a Sower were given up by the Chinese. On the 9th our heavy guns and baggage were brought into camp, and on the 11th the siege guns were placed in position in the grounds of the "Temple of the earth" within 155 yards of the walls. The remainder of the surviving prisoners were now delivered up. Their report told of the inhuman cruelties which had caused the death of the others.

The Ambassadors were now free to act, and allowed the Chinese forty-eight hours to accede to their demands, and open the Anting Gate, or to abide the consequences. The gate was delivered over to the Allies, as agreed on at noon of the 30th, and was immediately occupied by strong detachments from both armies, and the flags of both nations were hoisted high above the gateway.

On the night of 15th rain fell, and on the following morning the summits of the hills were covered with snow.

On the 17th the funerals of our murdered comrades took place in the Russian cemetery. The day was cold and cloudy with a cutting north wind.

On the 18th a party was sent out under Sir J. Michel to burn the Palace of Yuen-ming-Yuen. It was notified to the Chinese that this retributive act on our part was performed to mark our detestation and abhorrence of the foul murder of our countrymen, who had been treacherously captured and put to death while under a flag of truce. During the same afternoon, and throughout the 12th the sky was covered by the dense smoke of the conflagration. On the 20th the Chinese had agreed to pay the sum of 100,000 taels (about £33,600) as an indemnity for the murder of the prisoners. In case the indemnity was not forthcoming it was determined, (in fact the party had been already detailed) to assault the Palace in Pekin at 8 A.M. that day.

On the 24th the treaty was ratified, and a new convention signed by the British and Chinese, respectively, in one of the public offices in the heart of the city. The British Ambassador was accompanied by a mixed escort of 1,000 men, and Sir R. Mapier so arranged the troops of his division at various points of the town that treachery (rumours of which were current) was impossible.

The French Ambassador ratified his treaty the previous day.

From the 27th October until the departure of the British from Peking, Lord Elgin resided in the city.

Peking, or Shun-tyen-fu, the Court of the North, is divided into two cities, the "inner" and "outer city," or more generally known under the appellations of the "Tartar" and "Chinese" cities. The "inner" or "Tartar" city is almost square, and separated by a lofty wall from the "outer" or "Chinese" city. The *entire* city is surrounded by a high and massive wall, and has 13 gates. Over each gateway, and at each corner of the town, are built pagoda shaped barracks of four stories in height, which tower over the surroundings. Besides these gates, there are three others which connect the two cities. Within the "inner" or "Tartar" city is built the "Imperial city," shut out from the rest of the city by a wall 25 feet high and six feet thick, and inside the latter is the Palace of the Emperor which is surrounded by a wall, and a shallow ditch 100 feet in width. The ditch was dry, and does not appear to hold water except in rainy weather. The wall on the North face of the "inner" city averaged 42 feet in height, and 55 feet in thickness at its summit. At the base it is considerably more. Its brick revetment on the outer face was 6 feet, and on the inner 3 feet in thickness. Eight feet of loop-holed parapet may be knocked off by field guns, thus reducing the height to 34 feet. On the North face ramps lead up to the wall at the gateways, and at one place only, intermediately between them. The circumference of Peking, according to the Russian plan (which was the best extant in 1860) measures about 21 English miles. On the Northern face there remains but the bare semblance of a ditch, a horse may jump across the water. On the eastern face it is more marked, and the water wider and deeper. On the north-west face the ditch is similar to that on the north. The walls are in good repair, and could not be breached except by the heaviest guns, or by mining. The gates if not built up inside, might be blown open with powder bags, being similar to, but on a larger scale than those at Tang-chu. Between the inner and outer gates, there is an extensive *place d'armes*. The possession of the Anting gate made us master of the town. Cannon were planted over the gateways to sweep the wide straight street leading up to it, and sand bag traverses thrown up on the top of the wall at 400 yards distance on either side of the gateway to repel attacks from those quarters. Unlike the towns in the South of China, the streets of Peking are very wide and straight, running at right angles to each other, some of the streets being 50 yards wide. The houses are single storied and built of inflammable materials. Live carcasses or shells thrown into the city on a windy day would at once set the buildings in a blaze. Compared with the noble walls, the houses of the city present a mean appearance, and do not indicate such wealth as might be expected in so renowned a capital. The streets are densely crowded with human beings. There are cart stands in every main street and camels and mule carts meet the traveller at every step. Children's perambulators are not uncommon, and itinerant venders of tea, fruit, vegetables, and all sorts of viands and curiosities hawk about their wares on wheel-barrows. Fortune tellers

jugglers, and story tellers amuse the people with their, anecdotes and tricks, and elicit approval from their ragged audience. The fur shops are very numerous and appear to drive a brisk trade at the commencement of winter. The "Imperial City" is more poor and wretched in appearance than the other parts of Peking. The Generals were alone permitted to enter the Palace, and they represented the building to be mean and unpretending. The public offices lie between the south walls of the "Imperial city" and the wall of the "Chinese city." The temple of Confucius with its adjoining college is pretty without possessing any pretensions to grandeur and a monument in the grounds of the Lama Temple on the north side of the city has exquisite carving on it. The Allies had free access to all parts of the town except the Imperial palace.

Judging Peking by its vast extent and by the widely scattered and extensive suburbs, its population can be little, if any, short of two millions.

The Canal commences on the East face of Peking, at the junction of the two cities and appears to be fed principally by water flowing between the "inner" and "outer city." The paved road from Tang-chu enters Peking at the Chao-Yang-mun.

The appendix gives a meteorological table of the temperature during the coldest months at Peking. The houses are kept warm by stoves in which charcoal and coal are burnt, the latter being brought from the hills within 20 or 30 miles of Peking. The people rich and poor, one and all, wear furs and sheepskins in winter according to their means.

The back ground to Peking formed by the hills is very picturesque especially when covered with snow. The highest peaks visible in the further ranges are probably about 8,000 feet.

On the 28th the French buried their murdered officers in the Roman Catholic Cemetery on the west of the city. On the morning of the 30th snow was lying on the hills within 1,200 feet of the plain. The French Army retired towards Tien-sin on the 1st November leaving an Escort to attend Baron Gros. The British Force was collected near the Anting gate. The greater part of our troops had been housed since their arrival at Peking and were only exposed to the cold when on night duty.

The siege guns and superfluous stores having been sent down by water from Tang-chu with all sickly men, Sir R. Napier with half the Army retired on the 7th. On the same day Mr. Bruce reached Peking and was introduced to Prince Kung on the following day.

The Ambassadors, the Commander-in-chief, with the remainder of the army under Sir J. Michel marched at 10. A. M. on the 9th to the Pa-li-kao bridge, having sent on all the baggage two hours previously.

On the 11th the rear guard reached Ho-si-wu, where the corps destined to form the Tien-sin Garrison, remained until the troops which had preceded them had embarked.

On the 17th the rear guard evacuated Ho-si-wu and made Tiensin in three marches. On crossing the Wen-ho large quantities of loose ice were floating down the stream.

Snow fell on the night of the 19th and throughout the following day. On the 21st, sleet and rain turned the streets of the town into streams of slush.

The cavalry were still in Camp at Tien-sin and were delayed by the storm. On the 23rd of November they made a forced march to Taku, having previously placed their baggage and followers in gunboats. For the two following days it snowed heavily in the Gulf of Pechili, and off the Shantung promontory snow was accompanied by a bitterly cold wind from the North.

A campaign in the North of China in the opinion of Capt. Allgood, should close by the 15th of November at latest.

APPENDIX.

Mean temperature at Pekin in the winter. Taken from a Register kept by the French mission.

October	57°·11	Fahrenheit.
November	38°·23	"
December	30°·72	"
January	22°·99	"
February	30°·12	"
March	33°·06	"

II

THE KAFFIR WAR OF 1877-78,

BY MAJOR M. GOSSETT, A. D. C. 54TH REGIMENT,

(Continued from No. 36)

The defection of Mackinnon undid much of the good effected by Griffiths' successful march through Gealekaland, and shewed to what extent the seeds of rebellion had been germinating among the tribes Cis Kei. The Government was so satisfied with the completeness of the Gealeka defeat, that it had gone so far as to make arrangements for the partition of the land and the settlement thereon of Europeans. At the end of November, the Governor issued a proclamation offering pardon to all who would submit and lay down their arms with the exception of the leaders of the rebellion. But no sooner had the bulk of Griffiths' force left for their homes than the Gealekas eluding the police and others guarding the Bashee began to recross the river in small parties with their cattle and resume possession of their forfeited land.

Kreli, was at this time, according to report, in Pondo land, where he had taken shelter with Umquikela. Captain Blyth the magistrate in Griqualand East was authorized to demand his surrender and that of his son Sigcau. Umquikela professed profound ignorance of Kreli's movements and his refusal to move in the matter seemed likely to lead to political difficulties. Some there were who urged the advisability of obtaining compliance by force of arms, but to interfere with the Pondos at this time, when it became evident that the war on the frontier was only in its infancy would have been more than rash. The news of the return of the Gealeka's had been met by the Colonists with something of incredulity, but they were fully roused out of their sense of fancied security by the startling news, telegraphed by Griffiths on the 2nd December, to the effect that a strong patrol of police and Volunteers under Inspector Bourne had been attacked by Kaffirs in force at Holland's store on the Kogha and had suffered a loss of one man killed and 6 wounded; and that although the enemy had been beaten off they had repeated the attack later in the day on the camp itself, so vigorously, that they were able to carry off a tent and some cattle and horses. At the same time Mapassa who had been located in Gealekaland reported that the enemy were massing in force with the intention of attacking him.

Griffiths sent every available man to reinforce Bourne's force, and telegraphed for an increase of 500 men, 300 Infantry and 200 Cavalry with the object of forming a camp in the heart of the country. The

return of the Gealekas was a fresh proof of the insufficiency of voluntary effort unsupported by law and the Colony again found itself face to face with great dangers, and with a force not much stronger than it had for service three months before.

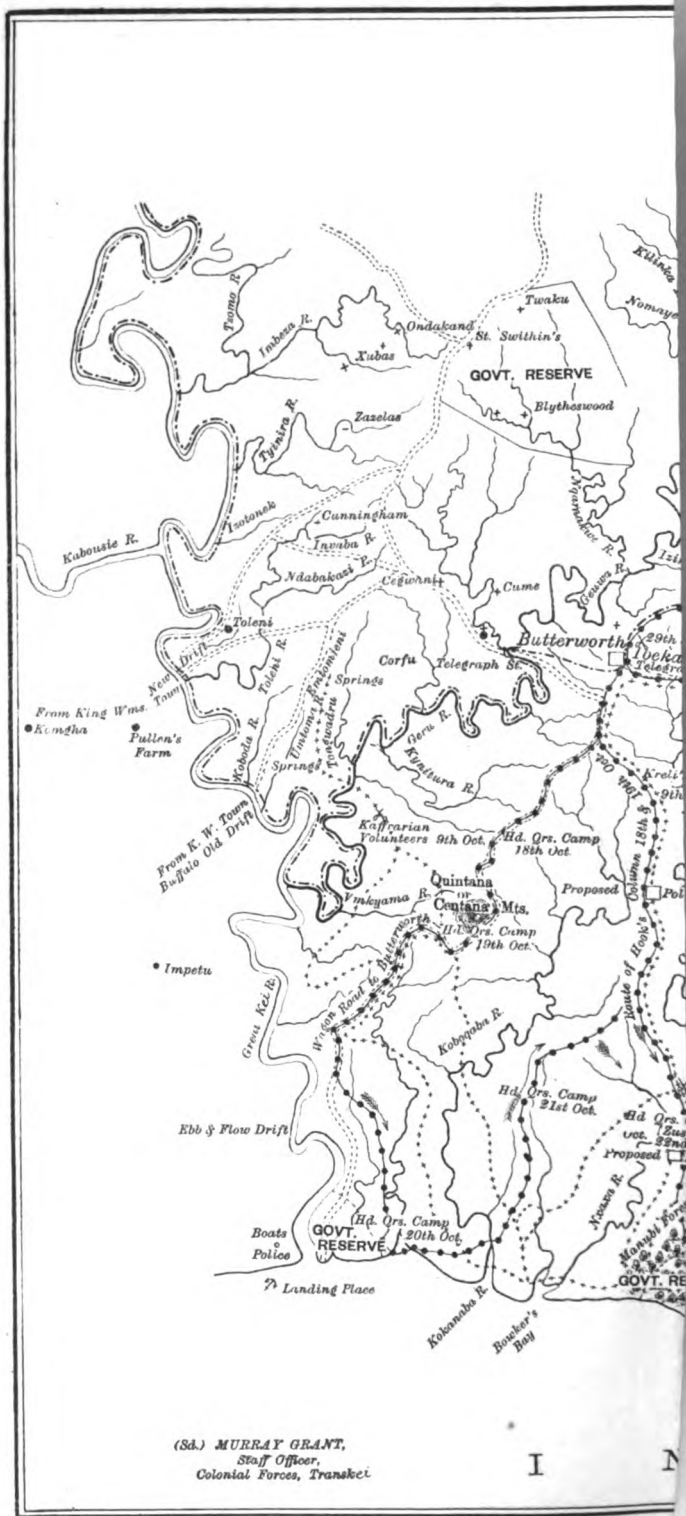
The Frontier police were used up ; a large proportion of their horses were unfit for immediate work and a large number of their men untrained recruits, 400 represented their effective strength across the Kei. Much difficulty was experienced in getting fresh Volunteers to come to the front and those that did enrol themselves were not of so good a class as those who had served under Griffiths, a general disinclination was shown to serve beyond the frontier, with danger so near their own homes; and many were dissatisfied with the conduct of former operations, and did not wish to repeat their experience. The Colony in fact found itself at this juncture, dependent on the Imperial troops ; and, although, when the Volunteers were in the field, the inclination to ignore Imperial assistance was uppermost, many now openly stated, that it belonged the mother country to swell the force already in the colony by additional Regiments. That these reinforcements were required there is no doubt, but that the Government was bound to furnish them was an assertion which Sir Arthur Cunynghame met by the argument that the Colony in accepting its own responsibilities, had really no right to place entire confidence upon Her Majesty's troops ; that it had ignored the necessity of any organised force and that in reality it was committed to make its own arrangements for defence.

The Governor himself had not ceased to urge upon the ministry the necessity of increasing the numbers and efficiency of the Police and by attaching them to the Posts occupied by the Imperial troops enable them to move.

Sir Arthur Cunynghame further pointed out the want of foresight which had led to the present state of affairs, and that he, although commanding all the forces Imperial and Colonial, had not hampered Commandant Griffiths in any way, but had left him a free agent in his operations merely confining himself to suggestions as to the best method of carrying the war to a successful issue.

To meet the demand for reinforcements Transkei, Sir A Cunynghame dispatched detachments of the 1-24th to Toleni and Ibeka and strengthened the Garrisons at Komgha and Pullen's Farm, and Colonel Glyn 1-24th took over the Transkei command from Commandant Griffiths.

But without mounted men Glyn's power to act offensively was crippled, and he suggested to make up for this want, that as many Infantry as possible should be horsed. This was done and in order still further to supply the want of Volunteers Colonel Palleine of the 24th Regiment received authority to raise a force of 400 Infantry and 200 mounted men to be Commanded by Lieut. Carrington 24th Regi-



The force consisted of 1,000 Europeans made up by detachments of the 24th, 88th Regiments, naval Brigade, and Royal marines from the "Active;" Royal Artillery and F. A. M. Police, 5 Guns and some Rockets and native Levies consisting of Fingoes and Tembus numbering 4100 men. This force was divided into four Columns. The Head-quarter Column under Colonel Glyn. Left Column Captain Upcher 1-24th Regiment. Right Column Major Hapton 88th Regiment, and the fourth under Major Elliott holding the line of the Bashee. Prudence demanded that the forces should be concentrated before an advance was made in the enemy's country, but it was evident that the number of Gcalekas that had returned was not, after all, very great or aggressive, since Captain Fuller of the Fingoe Levies was able to ride with 12 mounted men from Ibeka to Bowker Bay without molestation. Commodore Sullivan had proceeded with the "Active" and "Florence" to examine the coast and seeing some Gcalekas on shore near Bouker's Bay, had fired 3 shells at them. Captain Fuller volunteered to proceed to the Coast and communicate with the "Active" a courageous act which was duly appreciated by the authorities.

While these preparations were in progress to clear Gcalekaland, overtures were made to Kreli through Colonel Eustace for surrender. A meeting took place but Kreli held back expressing great fear of being sent to Robbin Island, the convict establishment in Table Bay. These negotiations ended in nothing, a price of 1000£ was put on Kreli's head and orders were issued for Colonel Glyn to advance.

On the 27th December Colonel Glyn put his various columns in movement, marching from the Springs and Ibeka. The line followed was much the same as that taken by Griffiths. On the 29th some opposition was met with on the Kogha, the enemy driven off by the Fingoes and 900 head of Cattle captured. From that date to the 7th January various parties scoured the whole country occasionally coming in contact with small bands of Kafirs who offered but little resistance, and on the 7th Colonel Glyn was able to report Gcalekaland clear, with a loss to the enemy of about 100 killed and 2,369 cattle captured. The casualties on our side being one European killed and one wounded and 19 natives killed and wounded.

Colonel Glyn further reported that it was impossible from the nature of the country to prevent small parties of the enemy returning, but that by establishing a line of entrenched posts at Fort Bowker, Malan's mission station, and Beachamwood, and by careful patrolling, all chance of any force of the enemy remaining in the country would be impossible.

In the meantime, news had arrived of the Gaika outbreak and the Fingoes attached to Colonel Glyn's column were anxious to return and protect their own homes.

This was permitted in some cases and on the 7th Glyn continued his movement to the Bashee, and further satisfied himself of the clear-

ance of the country. On the 10th he returned to Ibeka to co-operate with the forces acting on the other side of the Kei. Colonel Bellairs Deputy Adjutant General had been appointed to the Command of the Eastern frontier; and during the absence of Sir Arthur Cunynghame in the latter part of December at Ibeka, had been called upon by the Governor for any suggestions as to military measures necessary to be taken at once to meet the occasion.

He pointed out the necessity of keeping open the communications by a colonial force of mounted men between Kei Road and Komgha, then threatened by armed parties of Gaikas, in order to ensure the safe passage of convoys along this road and to protect the telegraph line; that steps should be taken to prevent a concentration of the Gaikas by placing a force east of Stutterheim and Fort Cunynghame to communicate with patrols under Commandant Schernbrucker on the west; that 1,000 Fingoes should be raised to be stationed at Cathcart, Fort Cunynghame, Kabousie, Komgha, Kei Bridge and Inpetu in order to relieve a portion of the forces occupying those parts and enable them to move, their strength at that time rendering it dangerous to move for fear of compromising the safety of those posts; while with the addition of the Fingoes, moveable columns could be formed to act for the dispersion of armed bodies in the vicinity.

He also advocated that certain districts should be proclaimed, forbidding the assembly of people within given limits, confiscating arms &c.

Sir Arthur Cunynghame, in endorsing those suggestions went further, and requested that all the posts held by the regular troops should be occupied by Colonial forces and the regulars concentrated for action where they could be most advantageously employed.

But the ministry had no idea of complying with Sir Arthur Cunynghame's demands and were in fact drawing out a plan of campaign irrespective of the Imperial troops who they wished to continue in the occupation of the various posts, while they carried out active operations with the Volunteers under the guidance of Mr. Merriman who had constituted himself minister of war.

At the end of December Sir Bartle Frere again pointed out how inadequate had been the efforts to supply the want of men; that the police force was still weak and inefficient, and urged that immediate steps should be taken to remedy those defects and supplement the Imperial troops with a force legally organized and capable of being called out promptly.

Turning to the Gaikas. On the 23rd December it was reported that "Kiva" an influential Gcaleka Chief, and strong supporter of the war party, had crossed into the Gaika location with a small body of followers. On receipt of this news the magistrate "Mr. Wright" was directed to

proceed to Sandili's Kraal on the Kabousie and demand that he might be delivered up.

Up to this time Sandilli who was well known as a vacillating, undecided man, had abstained from any overt act of hostility.—Kiva's advent had the effect, apparently, of doing away with all his doubts, and from that time he and his people were committed to war—The Gaikas throughout the location were found to be in a state of great excitement, and the war cry could be heard on all sides. Sandilli put off Mr. Wright with vague replies; and a few days later a party of his tribe made an inroad on the Fingoes from the junction of the Tsomo and the Kei, burning their Kraals and driving off their Cattle. On the 29th December a party of Gaikas burned the Hotel at Draibosch a few miles from Komgha, stopped the mail between these two places and swept off some Cattle.—On hearing this Major Moore of the 88th Regiment, who was employed as 2nd in Command of the F. A. M. Police, proceeded to Draibosch with a small party of the 88th and about 30 men of the Police. Falling in with about 300 Kafirs a spirited fight ensued, in which Major Moore was wounded and a Policeman killed; his party had to retire. On the following day the mail which had been detained left Komgha under an escort of 40 men of the 88th Regiment and 20 Police. A body of Kafirs in number about 600, advanced to attack and were met by Major Moore who took position on the road. After a fight which lasted for an hour and a half, the Kafirs attacking with much bravery at close quarters, they were driven off. Colonel Lambert hearing the firing marched from Komgha with reinforcements and arrived at the close of the action. On this occasion one man of the 88th and one policeman were killed, and four 88th wounded. Major Moore distinguished himself by his personal example and courage and was recommended for promotion.

It was now evident that the whole of the Gaika tribe were in arms, and the forces available to meet such an emergency were felt to be quite inadequate.

The actions of the 29th and 30th December had however greatly damped the ardour of the war party and given the rebels a wholesome dread of closing with the white man, and during the succeeding fortnight no attempt was made to arrest communication between King William's Town and the Kei, although convoys were perpetually passing under the eyes of bodies of natives, who watched their progress from the neighbouring heights without attempting to molest them.

On the 31st December the telegraph line was cut near Draibosch and Mr. Sievright, the acting General Manager of Telegraphs, despatched Telegraph Inspectors to find out and repair the damage. This was a service of considerable danger as the interruption took place close to the scene of the fighting of the previous day; but Mr. Smith and an escort of 12 Volunteers from the Police restored it within view of some of the rebels. This incident is worth recording as being the only

occasion during the war that the telegraph was interfered with; and that it was not damaged again can only be attributed to the superstitious ideas of the natives regarding what they term "lightning rods." The importance of the telegraph at this time cannot be over estimated, and the fortetearance of the rebels was a piece of good fortune which could not be calculated on.

On the 1st January acts of violence were committed in the East London Districts, cattle were driven off and homesteads burned. Captain Brabant at once proceeded to the Kweleghe river where this was going on, but finding the Kafirs in force and surrounding him had to retire. On the same day Mr. Tainton, a magistrate, who was proceeding with some Fingoe Police to support Brabant, was murdered together with his brother and a farmer.

The enemy had at this time collected in two main bodies consisting of Gaikas, T'Slambies and Gcalekas one in the rugged country north of Komgha in the neighbourhood of the junction of the Kabousie and the Kei, the other on the opposite side of the King William's Town—Komgha road, in the Chichaba Valley. Equally difficult from its deep Kloofs and thick bush.

To guard this latter district the following posts were occupied.

Impetu	100 men	1-24th Regiment.
Pullen's Farm	50	85th "
Fort Luisengen	17	Volunteers
<i>Near junction of Chichaba and Kei</i>		
Fort Buffalo	40	Do.
<i>Near mouth of the Kei</i>		
Komgha		88th Regt.

In December the ministry had only raised some 600 Volunteers to make good losses in the Police &c. and had handed over to the Commandant of the Force only 172 men, mostly footmen, while the remainder were held for action under the orders of Mr. Merriman. During the month of January operations extended over a wide area embracing the Transkei, the Chichaba Valley, the Gaika location and the Tambookie Location. Before describing them it will be necessary to draw attention to the action of the ministry in separating the Volunteers and Imperial troops and establishing a dual system of command. Up to this time there had been no actual conflict with the Commander of the Forces, although indications were not wanting that jealousy of the Imperial troops existed, and the manner in which Sir Arthur Cunynghame's demand for mounted men was ignored shewed that it was not the intention, if possible, to place the bulk of the Volunteers under his command although at the commencement of the Gcaleka outbreak his position as Commanding all forces had been fully defined and agreed to by the ministry. Sir Arthur Cunynghame had as already stated, striven to work harmoniously with the Colonists, by

avoiding interference with Griffiths in his operations but he was not prepared to relinquish power vested in him and was hardly prepared to find that a Colonial Army was to be put in the Field and their movements directed by Mr. Merriman quite independent of the Imperial forces. This line of action had however been determined on by the Premier, Mr. Molteno, and his arrival at King William's Town on the 9th January was the signal for its being carried out. Sir Bartle Frere at once attacked the conduct of the ministry not only as illegal, but also as a grave error. Mr. Molteno met the Governor's strictures by asserting, that the ministry were prepared to undertake the responsibility of putting down rebellion in the speediest and most effectual manner and that this could be best carried out by the Colonial forces, led by Colonists, unencumbered by military impediments, and that placing them under the control of the military authorities would tend to prolong the operations to an indefinite period. He also averred that the Burgher forces would not submit to military control nor cordially co-operate with regular troops and that they would only act and fight under their own leaders in their own way. This argument had been put forward more than once and had been accepted by the ministry and many of the Burgher commandants and Colonial officers as an axiom beyond dispute. But this question of friction was more or less imaginary. Many Volunteers preferred serving under military officers who they felt knew their business, than trusting to the haphazard tactics of their own men. This was not however the generally received opinion and upon this rock the Imperial and Colonial authorities split.

Mr. Molteno stated further, that the Governor of the Colony had no special powers over the Colonial forces as Commander-in-Chief, but as Governor acted in exactly the same manner with regard to colonial forces as he did with regard to any other Colonial matter.

This the Governor denied and pointed out that the intention of the constitution was, that the Governor and Commander-in-Chief should be in chief command of all military forces of every kind Colonial as well as Imperial, performing all executive duties through a Commander of the Forces whose Commission gives him power to command Her Majesty's troops and who may be empowered by the Governor and Commander-in-chief to command Colonial forces formally declared to be in the field of military operations. He also pointed out the illegality of the office which Mr. Molteno proposed to create of Commandant General with supreme command over all Colonial forces entirely independent of the Governor or Commander of the Forces. It is not within the scope of this paper to pursue the subject further, suffice it to say that Mr. Molteno acting under the dictation of Mr. Merriman who was the prime mover in the matter refused to give way and insisted that Mr. Griffiths should be sent from Ibeka to take over the Colonial forces Ciskei as Commandant General and that the action of the Imperial troops should be confined to the Transkei.

OPERATIONS TRANSKEI

Action at Newmaka.

Turning to the columns acting under General Cunynghame in the Transkei. Colonel Glyn had on the 10th January arrived at Ibeka from the pursuit of rebels to the Bashee, the object being to prevent the Gaikas, against whom Colonel Lambert was acting, from crossing into Gcaleka land. During Colonel Glyn's movements a column under Major Hapton 88th Regiment had been in observation near the Manubie Forest. On the 10th this column had been ordered by General Cunynghame to move to the Quintana mountain, as Gaikas in some strength were reported to have crossed the Kei. The same day Major Owen 88th Regiment took over command from Major Hapton, whose services were required in the neighbourhood of Cathcart. On the 13th Colonel Glyn was ordered from Ibeka to reinforce Owen and take command of the whole force. A few hours after his departure, on the 13th, General Cunynghame learnt from native sources that Owen's column was to be attacked that afternoon. He accordingly sent his Aide-de-Camp Lieut. Coghill to inform Colonel Glyn and tell him to push on in support.

Colonel Glyn was pitching his camp when the despatch reached him, but in $\frac{1}{2}$ an hour resumed his march and joined Owen whose force was paraded ready to start. Hearing that large bodies of the enemy were gathering on the neighbouring heights. Colonel Glyn left Captain Robinson R. A. and 70 Police with two 7 pr. guns to protect the Camp and advanced. The united force consisted of 2 companies 1-24th Regiment—1 company 88th—1 do. Royal Marines—1 Troop Police, some rockets under seamen of the "Active" and 2 guns. It advanced, covered by 200 Fingoes under their head man "Veltman." The first line consisting of a company 24th, 1 company 88th—the guns and rockets were commanded by Major Owen, the flanks being protected by Police, while Captain Upcher commanded the reserve. On seeing the force the enemy advanced to attack, but a well directed rocket at 1,200 yards turned them and they commenced their usual manœuvre of moving round the flanks covered by deep wooded ravines (or Kloofs); after a fight which lasted for an hour and a half and during which the whole of the forces were engaged, the enemy fell back with a loss of some 60 killed, the loss on our side being 4 men of the 88th wounded and 1 Fingo.

During the next fortnight the forces in the Transkei were occupied in patrolling and keeping Gcaleka land clear of the enemy. On the 27th Sir Arthur Cunynghame left Ibeka and returned to King William's Town. On the 25th January information reached Colonel Glyn that a large body of Kafirs had been driven into the N'Yamini bush and also that Mapassa was expecting an attack, and on the 27th he sent a column under Captain Upcher consisting of 300 men of the "Active" 24th, 88th, and Police into the N'Yamini Valley. On the following day when making a reconnaissance he encountered and drove back some 500 of the enemy. On the 29th January having received a reinforce-

ment of mounted men and police under Captain Grenfell A. D. C. and 300 Fingoes, Upcher attacked and drove the enemy out of the bush killing several and taking 400 head of cattle. In this affair one Blue jacket and 5 Fingoes were wounded.

OPERATIONS IN THE CHICHABA VALLEY.

On the 4th January, Colonel Lambert anxious to ascertain the strength of the enemy and their intentions, sent a reconnoissance of some of the 88th Regiment and Police with two Guns into the Chichaba Valley.

This force which was under the Command of Lieut. Moore, discovered the enemy to be in considerable force with large herds of cattle. A fight ensued in which three men of Moore's party were wounded with a loss to the enemy of 20 men. On the 6th January, Colonel Lambert received a cypher message from Captain Wardell Commanding at Impetu to the effect that the small detachment at Fort Buffalo had fallen back on Impetu and that his post was completely surrounded and cut off. This report having been telegraphed to Colonel Bellairs, he ordered the post to be relieved. It is easy to be wise after the event and small isolated posts without the power of acting offensively are, as a rule, of little use, but Impetu from its position was important and it would perhaps have been better to reinforce it rather than abandon it. Colonel Lambert left Komgha on the 8th January with a force of 467 Infantry 86 Horse 250 Fingoes and two Guns. He marched to Impetu without encountering the enemy and on arrival found that the Detachment at Fort Von Luisengen had also joined Captain Wardell, having with the assistance of some of Mapassa's people fought their way to Impetu.

Colonel Lambert then returned to Komgha not thinking it advisable with the small force of Fingoes at his Command to risk an attack. On the 15th January having received a reinforcement of Fingoes under Messrs. Maclean, Streatfield and Pattle he again left Komgha, his force being divided in two Columns of about 200 Europeans and 100 natives each and three 7 pr. guns, with the intention of moving along the ridges on either side down the Valley, assisted by two bodies of Fingoes of 500 each sweeping the Bush in the valley between. Captain Brabant at the same time supported the movement of the troops with about 300 Volunteers and natives in the neighbourhood of Impetu.

Brabant's force was however, at this time like other Colonial forces, save what had been handed over to Colonel Glyn and Colonel Lambert, not under Imperial contract, but acted under orders from Mr. Merriman.

These operations which extended over three days, resulted in the capture of 12,000 head of cattle and 8000 sheep, some 60 Kafirs were reported killed, but in no case was any serious opposition encountered

as may be seen when the loss on our side was only two Europeans of Brabant's force wounded, and one Fingoe killed and two wounded.

The Chichaba valley was regarded by the natives as one of their most important strongholds owing to the great extent of impracticable bush and rough country, with its communications open in two directions to the valley of the Kei on the one side, and the valley of the Kabousie and Kwelegha on the other. It is to be wondered at, under such favourable conditions, that they made so poor a stand. As it was, although it was known that they were in force they never shewed in any numbers and abandoned their cattle to save themselves by flight, melting away as only Kafirs can do.

On the 17th January Colonel Lambert withdrew his forces to Komgha leaving to the Fingoes the task of keeping the Valley clear. Colonel Lambert during the next few days sent strong patrols along the Kei Valley to the mouth of the Kabousie resulting in the capture of 500 head of cattle. Learning that small bands of Gaikas or Gcalekas had returned to the Chichaba Valley two columns were again despatched on the 22nd January to dislodge them. As on the former occasion the enemy fled without making a stand, and 2,250 head of cattle and 1000 sheep were taken; Sandilli himself was supposed to be in the bush and nearly fell into the hands of the troops, leaving between 70 or 80 horses with their trappings behind. The Chichaba Valley having been thoroughly cleared, Lt. Colonel Lambert patrolled the country towards the Kei mouth and returned to Komgha.

On the 30th January many women and children in a deplorable condition from exposure and starvation gave themselves up or dispersed to get work in the Colony. It became a question for the Colony as to how they were to be disposed of. If allowed to remain in the area of rebellion, they either died or rejoined their husbands acting as their Commissariat agents and carriers of their worldly goods.

OPERATIONS IN THE GAIKA LOCATION.

Mr. Molteno having determined to carry matters with a high hand regardless of the remonstrances of the Governor, issued instructions for the movement of the colonial forces in the Gaika location. Commandant Frost was given command of the Force, and was ordered to take up a position between the Section of the Gaikas under Sandilli, then in open revolt and those under Anta who although disaffected were not openly troublesome, and advance on the road leading from Greytown to the Bolo Drift until he had effected a junction with a force of Fingoes under Captain Rorke who at that time was engaged in protecting the Fingoe border. Frost was then to move in the direction of the Lugilo Mission Station and clear the country to the confluence of the Kabousie and Kei, when they would be joined by another force under Commandant Ayliff. Commandant Schermbrucker was at the same time to make a demonstration to the right of the Emgwali Mission Station, to cut off

fugitives from crossing the Kabousie towards the Amatolas. This plan was submitted to the Governor who pointed out the danger of undertaking such enterprises with an imperfectly formed column in a difficult country and declined all responsibility for the same. Colonel Bellairs at the same time stated that it had been his intention to carry out this operation with a carefully formed column of all arms—and that it would have been then in progress had he been furnished with the native levies he had applied for. In fact the colonial Government was so intent at this time on suppressing the rebellion themselves, that they not only withheld native levies from Colonel Glyn and Colonel Bellairs, but withdrew Captain Rorke and his men who were defending the Fingo border to act with the force they had put in motion.

On the 14th January (the day before Colonel Lambert's march to clear the Chichaba valley) Commandant Frost moved his force consisting of about 400 Europeans 250 Fingoes—cleared the Xacu Forest and the difficult and broken country about the sources of the Bolo and Umguali Rivers and effected junction with Rorke who had crossed from Fingoland without opposition. The united forces then cleared the country to Lugilo—when they were joined by another column of Fingoes under Captain Macgregor, who had been directed by Mr. Ayliff to cross at the junction of the Tsomo while he with a smaller force watched the Kabousie mouth. After scouring the country effectively about Lugilo, Frost moved to Komgha where he joined Ayliff who had worked up the Kabousie.

From thence he returned to the Umguali Mission Station and encamped there on the 22nd January.

Credit must be given to Commandant Frost and the other Commanders for the success of these operations which resulted in the capture of 6,000 head of cattle, and about an equal number of sheep and goats, but the opposition encountered was very slight, the Gaikas fighting in a half hearted way, which was to be wondered at since they were defending their own Kraals. In commenting on these operations Sir Bartle Frere while acknowledging their success, laid stress on the fact that the reports of the various Commanders contained in themselves sufficient evidence how much more perfect the results might have been had their movements been less desultory and under one general head.

OPERATIONS IN THE TAMBOOKIE LOCATION.

It had been known for some time that Gongahella a Tembu Chief whose estate adjoined the Gaika location was disaffected, and that he had been in correspondence with Kreli and Sandilli, but up to the middle of January he had not openly joined the rebel Gaikas. Sir Bartle Frere anxious to avoid extending the area of rebellion had not ceased to urge on the ministry the advisability of postponing any operations against Gongahella until they could be carried on in a carefully concerted manner so as to ensure success with the least possible bloodshed. But

his warnings were of no avail. Mr. Merriman had made up his mind to ignore all control, and without consulting the Governor in any way issued instructions to Mr. Hemming the Civil Commissioner in the Tambookie Location to arrest Gongahella, at the same time placing in his charge a considerable force to carry out his instructions.

Mr. Hemming put his force in motion, on the 24th January and marched from Bolotwa towards Gongahella's Kraal in two columns and after an action which lasted for two hours stormed the hill on which the Kraal was situated and dispersed the enemy who left a large number of dead on the field. The details of this action as given in Mr. Hemming's despatch are somewhat vague, but this much may be gathered that one of the columns was surprised by the enemy who opened fire on them at close quarters and some hard fighting ensued before they were driven back. A force of 300 Gaikas were reported to be with Gongahella on this occasion. After the action they fled to Anta's Location. Hemming's force under a Mr. Thomas pursued the enemy to the broken country about the junction of the Kei and Indwe and a few days later suffered a reverse and found themselves without ammunition and supplies.

As Sir Bartle Frere had anticipated, the effect of these ill considered operations, undertaken without proper means, was to encourage the disaffected and cause the rebellion to spread.

In the meantime Mr. Merriman had ordered Mr. Griffiths to leave Ibeka and proceed to the Tambookie Location to take command of the forces acting under Mr. Hemming.

This force had been reinforced by the Diamond Field Horse a corps of Volunteers raised at the Diamond Fields, at Kimberly, Griqualand West, by Captain Warren R. E. and which had been arrested on its march by Mr. Hemming to assist in quieting the Tambookies.

By the end of January the dispute between the Governor and the Ministry had reached its climax. Finding that his expressions of disapproval of the action of Mr. Merriman had no effect, Sir Bartle Frere addressed a minute to the ministers on the 31st January, in which he pointed out that the Civil War was rapidly spreading through the Gaika and Tambookie Locations—that it had already extended to the frontier sea coast districts and that the Police and other forces at the disposal of the magistrates were utterly unable to cope with the spreading evil; that the operations conducted by Mr. Merriman had been at the best inconclusive and mischievous in their results; and in the case of the Queenstown contingent had been attended with reverse which would be magnified by the enemy into a virtual defeat. That Mr. Merriman in assuming independent authority was working outside the limits of his Office and in dealing with questions of war he was acting illegally.

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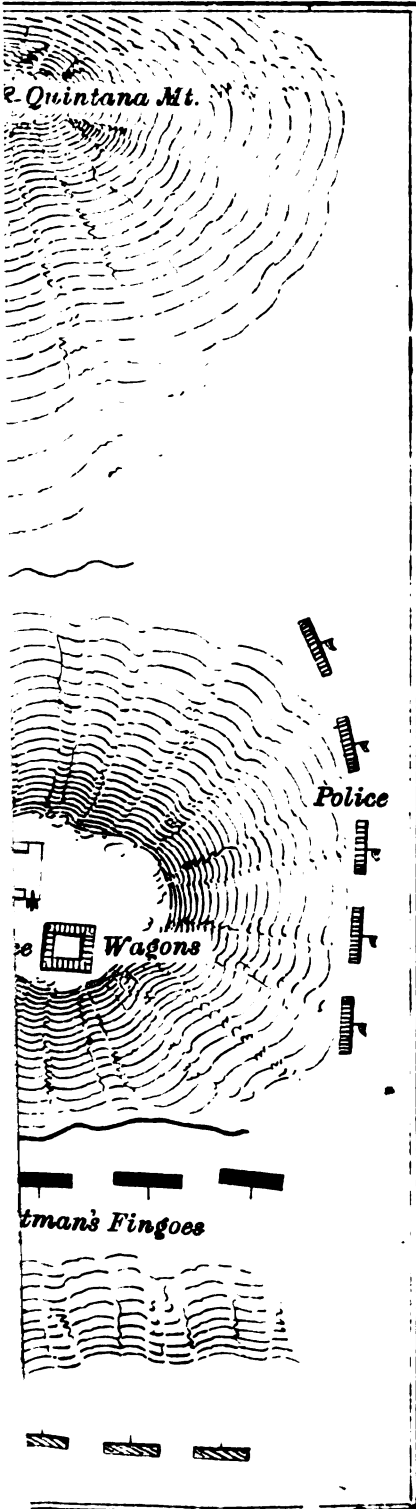
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between Ibeka and Quintana, to be in readiness to re-inforce either post in case of attack.

On the morning of the 7th February at day light the Kaffirs advanced to attack Upcher's Column. Preparations had been made to meet this attack, by shelter trenches dug outside a small redoubt which had been thrown up on the hill about 1200 yards south of Quintana Mountain. The two guns were in the fort, men had been told off to man the parapet and trenches, one company of the 24th was sent out in skirmishing order to line a small knoll in front and to retire so as to draw on the enemy, while Carrington's horsemen patrolled to the north with the same orders. On the right of the position was a wooded Kloof, in which a strong body of Fingoes was placed.

The first advance of the enemy, in number about 1,500 men was made from the south and west.

At 1,200 yards fire was opened with the guns and rockets but the enemy came on with great determination until they arrived within 900 yards when they came under fire of the Henry Martini rifles. After 20 minutes heavy firing the enemy who had got within 400 yards of the left of the position, broke and fled pursued by the Frontier Light Horse and Fingoes under Veltman.

The Frontier Light horse having returned from the pursuit the men were ordered to commence their breakfast, when a large body of Kafirs was seen approaching the right flank. These were the Gaikas under Sandilli. Captain Upcher detached a force under Captain Grenfell A. D. C. to meet them at the same time another body was seen coming up a small wooded Kloof on the right front, which was cleared after an hour's fighting. By 10-30 o'clock the Gaikas fell back on all sides and retreated out of range and finally disappeared under the fire of the 9 pr. gun which was sent out to the front to shell them, Captain Robinson and his column came up at the close of the action and assisted in following up the flying enemy.

In this action the enemy suffered severely losing over 200 men killed; our casualties being 2 Fingoes killed and 9 wounded and 2 Europeans slightly wounded. These disproportionate numbers can only be accounted for by the power of the breech loader skilfully used and the bad shooting of the enemy. A large proportion were slain by the Fingoes in the pursuit.

It will doubtless strike the reader as a remarkable circumstance that so large a body of the enemy could elude the forces patrolling in so many directions and collect at any one point. But any one who has had experience in Kafir warfare will bear witness to the power they have of melting away as it were and concealing their movements to re-appear in force in some other place. Their intelligence department is perfect, spies find their way to every camp and the movements of

our forces were often known as soon as they had been determined on. Added to this their powers of endurance are very great. They can travel 50 miles at a stretch without fatigue and their Commissariat is of the most portable nature. In their Kraals in peace time they rejoice in supreme idleness, all kind of work is distasteful to them; so that it is all the more to be wondered at that they are able to endure so much physical exertion when called upon by their Chiefs.

With the battle of Quintana active operations in Gcalekaland closed. The Gcalekas thoroughly disheartened dispersed, and the Gaikas under Sandilli re-crossed the border into the Gaika location. Nothing remained to be done in the Transkei, but to keep the country clear and prevent any fresh inroad by hostile Ciskei tribes and to eradicate the small parties of starving men who having lost their cattle trusted to robbery for subsistence.

In the Cis-Kei, bands of rebels had established themselves in the bush country on the Nahoon River and other parts of the East London District, as well as in the Gaika location, the Tambookie location and elsewhere. Commandants Brabant, Frost, Schernbrucker and others were engaged during the remainder of the month in operating against them, but on no occasion were they encountered in any force; Sandilli was however, collecting his men together on the Thomas river and at the end of the month Commandant General Griffiths had drawn the greater part of the Colonial forces together to surround him.

On the 23rd February Major General The Hon'ble F. Thesiger C. B. who had been appointed to succeed Sir Arthur Cunynghame, landed at Cape Town and on the 4th March arrived at King William's Town and assumed command.

III.

MOUNTAIN ARTILLERY (CONTINUED) PART II. AND III.

BY LIEUT. J. C. DALTON, R. H. A.

HYGIENE.

Grooming—Food—Clipping—Exercise—Shoeing.

GROOMING.

This is not so indispensable for keeping the mule in good health as is generally thought; real cleanliness should be ensured by paying attention to the nature of the food and to the localities the mule has to occupy. The animal in his state of freedom does not scrape himself as with a curry comb, his method of cleaning himself consists in rolling on the ground and well shaking himself, bringing the subcutaneous muscles, into play; at the same time he has a varied food of herbs and breathes a pure air; therefore it is but natural that if one desires to keep the animal healthy and robust in a state of slavery, his mode of life should be assimilated as far as possible to what he was accustomed to in nature and during his early years.

In the army grooming is carried to excess, to some animals it is torture, the* curry comb acting often on the most tender parts of his body, causing irritation and pain; the mule defends himself by kicks and bites occasioning a daily tussle between him and his driver if the latter persist in the operation; and vicious habits are often originated thus. Putting aside the method of grooming animals in general, for here we are only considering the mule, the latter can be made sufficiently clean by means of the "*lua*" † and horse rubber, rubbing him with them sufficiently hard to avoid hurting him, and ensuring there being no dirt left on the skin; also by washing the extremities and particularly the tail frequently, except of course in the case of those animals restricted by the Veterinary Surgeon on account of their health.

Civilian mule drivers (*arrieros*) do not use curry combs, brushes or sponges for cleaning, but simply a wisp of straw, acting up to the old proverb, "Groom the horse with the straw he leaves in his manger," which implies that it would be better for him to eat all his food than that he should leave anything for want of appetite. Curry combs,

* The Spaniards would appear from this to have a different method from ours, of using the curry comb, and scrape the animal's body with it. I. C. D.

† A *lua* is a species of glove without fingers made of esparto grass, for grooming purposes. I. C. D.

brushes, &c., are bad, they are always getting lost, they help to wear out the nosebag in which they are carried and are difficult to replace in the country as they are not to be found in the villages of the mountainous districts. If these articles were suppressed, a considerable sum of money might be saved to the regimental recreation fund without the slightest detriment to the well-being and appearance of the animals.

FOOD.

The lamentable state of agriculture in Spain caused by the ignorance and backwardness of the greater portion of the labouring class, who are wanting in the most elementary knowledge and adhere blindly to the customs of their forefathers, consequently checking all progress, is deleterious to all the institutions of the state including the militia. Hay is almost unknown in Spain. In France, Germany and especially England, hay is much valued for its nutritive qualities, and constitutes a great part of the food for army horses. In Spain it cannot be given to the army in great quantities, hence it is better to pass over this want in silence and make the best of the more abundant and cheaper products of the country viz: barley and straw.

BARLEY.

The daily ration of barley for each government mule in the field is a little over a peck (9.25 litres) and in peace time, a third less is given. This ration is ample for the mule, and although all do not eat it, what one leaves another eats in addition to his ration; the gun and carriage mules naturally requiring the most as they do more work than the others.

The ration of barley is given in three feeds; morning, noon, and evening, it might be desirable to divide it into four feeds, especially during operations, when the ration is larger, an extra feed being given in the afternoon between the 2nd and 3rd feeds.

In long or forced day's marches when only 2 short halts are allowed and even in ordinary marches, it is desirable to carry a feed for each animal in a nosebag and give it when an opportunity occurs, because the officer Commanding the battery can never make sure of concluding the day's march at the particular village or town he intends to put up at, the necessities of warfare may change all plans at the last moment and for this reason no opportunity should be lost of keeping the animals as fit as possible for the work they may be called on to perform. There need be no fear of giving too many feeds in the day, because it must be remembered that the animals in their natural state are always eating, which proves that the stomach requires to be constantly attended to.

With a good régime and little work, the animals get fat but are none the better for it if suddenly called upon for an extra amount of

work, and also for other reasons (of which anon) are not the better fitted to carry the pack saddle.

The barley obtained at towns and villages is rarely good and often bad, in the former case it is advisable to mix a little common salt with it, and if very dirty it can be washed a few moments before giving it, in the 2nd case any vegetables that come readily to hand should be given, taking care of course not to give too much wheat, green stuff or new barley which cause indigestion. The mule, like all herbivorous animals, is very fond of green food which is wholesome for it on hot days and when hard worked, in which cases it acts as a refrigerant.

CHOPPED STRAW.

The ration of straw in peace or war time is about 19 lbs. (875 kil) daily. On a march the nosebags are filled with it, the barley being at the bottom so that it can't jerk out. Straw is by no means nutritive and serves to fill the stomach without proportionately nourishing it. Whilst the animals are in the stables, the stablemen keep administering chopped straw every two hours, and still oftener to those mules who shew signs of impatience or hunger; seeing that it is chopped as fine as possible, both for economy and to assist mastication. In camp if the wind is very high, the straw gets blown away and to avoid this, it is advisable to wet it before giving it, and if possible to add a little flour or meal if obtainable.

The best barley available should be selected and the straw should be wheat straw. Because the mule is more patient and easier satisfied than the horse, there is no reason why it should not be treated equally well, and shewn other little attentions which are extended to the latter viz: the addition of flour or bran, soaked beans in autumn, green food in spring &c., and whatever good food can be obtained in the country.

WATER.

Water is as essential to the mule as food, he should get as much as he likes, regularly twice a day in summer and once in winter. Water acts more as a means of dissolving the contents of the stomach than as a nutritive substance. The water containing most Nitrogen is the best, and as water recently drawn from wells contains but little atmospheric air either absorbed or in combination, it is therefore poor in Nitrogen and Oxygen and is apt to promote indigestion, thus it is advisable to guard against this by shaking the water violently, and stirring it about well with the hand before giving it to the animals. Mules refuse to drink fetid or bad smelling water unless driven to it by heat or thirst. The olfactory nerves act in this instance as an advanced sentinel of the stomach and give warning instinctively of the danger. Muddy water full of earthy matter is not noxious, for example such as is found in ponds, muddied by animals walking into them. Regulations for watering the animals in time of peace are laid

down, but in the field, the Officer Commanding the section exercises his own judgement on this matter, and arranges the hour of watering. Often, water given in the morning is apt to provoke colic and diarrhœa. On marches, even if the animals sweat they may safely drink so long as they continue in motion after drinking. Should they enter the water, it will do them no harm as it refreshes the extremities, but they should not be allowed to drink too near the edge as they might take in leeches with the water. Before watering, the breast harness and girths should be slacked.

Water should always be given before, and not after eating, to secure proper digestion.

CLIPPING.

The mule changes his coat according to the climate of the station he is in, in summer it is short and fine, in winter, rough and bristly and more like the coats of animals inhabiting cold climates. There are no special regulations for trimming mules. In the Mountain Artillery it is the custom to clip the upper half of the body (including the neck) two or three times a year, hogging the mane short in the form of a bow to look like the crest of a horse. It is also customary to cut the hair inside the ears. Although this appears cleaner, it must be remembered that nature provided this covering as a protection, to prevent the entrance of extraneous substances such as little bits of straw, small flies (*hipoboscus*) &c., into such a sensitive organ. The mule resists to the utmost this operation of cutting the hair in the ears, and it would be quite sufficient to simply cut short those hairs that project beyond the face of the ear. It is also of very little use clipping the neck because none of the harness comes against it and clipping renders it much more exposed to the stings of those flies (*Zoofagos*) which annoy the mule so much in summer. The pedlars of Cataluña only clip those parts of the sides on which the packsaddle bears, and in the field the Officer Commanding a battery could easily content himself with the same amount, especially if there should be a lack of good clippers &c.,

No rules can be laid down for clipping but it does not appear advisable to clip many times in the year; the autumn clipping is not economical because the hair grows again so quickly that in about 20 days after it has been done, the hair is nearly as long as before. The best period is the month of January. Climate, food, and work, have a large influence on the growth of the hair; it is a good thing to wash the part clipped, directly afterwards, with a concoction of wine and rosemary. The mule does not breed lice on his body, but often gets them off the fowls and other birds of the farm yard which contains the dirty stable he is billeted in; they then live on him and if this evil is not at once combated it soon causes a regular disease (*tiriasis*), to eradicate which the mule must be clipped and washed with tobacco water or rubbed with mercurial ointment and strong vinegar.

The length of the tail should be to the point of the hock, it would then be sufficiently long to reach the flanks and would still be kept from getting full of mud when marching in bad ground. It also ensures uniformity in the ranks.

The pasterns should not be clipped as a general rule with all mules, for that is one of the most sensitive parts of the animal. For those that have a great amount of hair on the legs and pasterns, which must therefore be clipped, a particular sort of scissors and comb combined may be used. It is much used abroad and might with advantage be introduced into the Artillery Service.

SHOEING.

The hoof of the mule being so immensely superior to that of the horse in good qualities, is much more simple to shoe. One shoeing smith, fairly capable, can keep 30 or 40 mules shod up; the shoes of course wear out faster or not according to the ground the mule works on, the greatest consumption is from 3 to 3½ shoes per mule, per month, when working over hard ground in hot weather and the least is from 1½ to 1 if over softish roads or across grass land &c. In mountainous countries mules lose a good many shoes, from the roads or paths being stony and unequal and often the beds of mountain torrents; the shoe gets wrenched off and the hoof is often badly broken; the number of nails in each shoe is excessive and attention might be well directed to this point, to determine how few nails could be done with.

The sections of Artillery should always be well supplied with shoes and necessary materials, allowing three shoes and 10 nails per mule, per month: as they are very difficult to get supplied in the mountain villages and poor districts, owing to the ox being much more universally used for agricultural purposes than the mule. Many mules are very troublesome to shoe; but before having recourse to violent means, such as twitches and shackles, it would be better to try and effect the purpose by stratagem; and it is a mistake that in barracks there are no wooden frames (*potros*) for shoeing unruly horses. By having these much time trouble and coal would be saved in shoeing.

EXERCISE.

If the animals remain too long a time in the stable, they lose much of their capability for work, the muscles become flabby from rest, the extremities get affected with humours which apart from organic laws follow those of gravity and augment the danger of wind-galls, thrush and all the infirmities affecting these parts; they do not breathe pure air, neither are the stables properly ventilated. Exercise as a hygienic measure should be as frequent as possible and from 2 to 3 hours at a time. It should be given in high situations and well away from towns, so as to get as pure air as possible. The drivers should not be mounted, as by walking both they and their feet gain in health and

soundness, the animals should be loaded, so as to keep their backs in good order. If these points are attended to, both men and animals ought at any moment to be in a fit condition to take the field.

It only now remains to terminate these remarks on hygiene or on the best way of preserving the health of the mule for Mountain Artillery, to consider briefly the best conditions for stabling, and to point out the defects which often render stabling insalubrious.

STABLES.

Few exist which have been specially constructed as such; generally civilians select the worst situation about their house, in which to make their stable; it is in some cases a dark and damp cellar, in others a dirty shed, with draughts on all sides. The working animals such as farm and cart horses or mules remain away from the stable the greater part of the day, and when they return to rest themselves, they require besides food, perfect rest and comparative silence and absence of flies (*Zoofagos*) which so worry and annoy them; for this reason in *Ventas* (country inns) they prefer to have dark stables, and an idea exists that cobwebs keep off the flies and if there be any good in this, it is more than annulled by the evils arising from dirt. However this may be, nothing should hinder a very careful examination of these places which are so behind the age and full of filth; very far beyond the pale of civilization and of the necessities of the Artillery Service, which unfortunately is obliged to endure the pernicious effects of such unwholesome localities.

Military animals, educated by war, have to live in quite a distinct manner from those of the farmer or mule driver. During peace time it is necessary to treat them and educate them for war so far as the conditions of garrison life will allow and with the greatest economy to the state; keeping up their strength, not ruining them with over work, nor on the other hand with too much idleness in the stables. Comparing a mule to a machine we may say that too little use makes him rusty and too much, destroys and wears him out.

The animals being born with the necessary conditions to enable them to live in a state of nature without the assistance of man; and fields, open country, sun and air being indispensable for their proper growth and health, it is but natural that to enable man to obtain good specimens of the species he seeks to preserve, the conditions of food, air &c., should be assimilated as far as possible to nature; and one of the most important of these conditions is Reform in the matter of ventilating stables.

The accumulation of a number of animals in a stable, however well situated it may be, must cause the air to be charged with *Miasma*, noxious to their health; the constant emanations of urine and dung charged with ammonia, and the air emitted by the breath being more charged with Carbonic acid than that drawn in, so tend to alter the

state of the atmosphere, that several chemists have calculated that a horse will die of Asphyxia at the end of 24 hours, if enclosed in a hermetically closed space containing 30 Cubic mètres of air (1059,5 cubic feet), the quantity a horse is supposed to consume in one day.

Boussingault analyzed the air of a stable and found that it contained 7 times more carbonic acid than did the air in the country around. Therefore the principal point to attend to in building a stable is the preservation as far as possible of the pureness of the air. Windows are placed in stables for this object, and they are frequently situated very low down in the walls and at about the height of the animals head, a grave error which leads to Catarrh and other ailments as the animals are inhaling directly air from outside colder than that inside. The windows should if possible be in the walls behind the animal and sufficiently high up to allow the light and heated air (which ascends) to escape by them, the exterior air being introduced by means of small ventilators, well distributed, let into the lower part of the same wall; by this means the renewing of the air will be uniform, and the strata of different densities will move by degrees and in succession. The windows should be so constructed that they can be opened or shut at will so as to give more or less light, to avoid the direct action of the sun's rays, entrance of dust &c.,

Stables for mules should be wider than others to allow for the space occupied by the packsaddles and to facilitate the ingress and egress of the animals, when harnessed up; under these conditions, 5 mètres (16 feet 5 inches) is the least width that could be given to a simple stable to contain one row of mules, as will be seen below.

Width of Manger.	0.70	mètres
Mean length of mule	2.00	"
Passage	1.70	"
For Pack Saddle	0.60	"
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Total	5.00	"
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The Mangers vary in width with the size of the stables, the class of food, and the number of animals. In the hay countries, where hay forms a part of the food and is plentiful, two rows of mangers are made in the centre of the stable, leaving a narrow passage between them for the forage &c., These stables, called double stables, need much space in width and moreover Spain is deficient in hay. The most general and best way of economizing ground is to join the mangers together in one long line, and joined to the wall. It frequently occurs that the Manger is too high and in some cases projecting, which is dangerous, as the lower part has a corner against which the animal is apt to hurt its face or eyes when getting up. The best height for the manger is 1.10 mètres (3 feet. 7 inches.)

Great attention should be paid to drainage and level. There are many opinions about both points, also about the best material for paving the stalls with.

If the drain be in the centre of the stall, the floor can be level, with a drain in the centre. The part under the fore and hind feet of the animal should be paved with wood about $\frac{1}{2}$ a mètre wide, going down the whole length of the stable parallel to the manger. Under the animals bellies, between the two rows of wood pavement there should be a gutter made of cobble stones, containing holes at intervals which communicate with a drain running longitudinally under it for the purpose of taking off the urine.

BREAKING IN THE YOUNG MULES.

The young mules being collected in a stable, supposing them to be shod and broken to the manger, the next thing to do is to break them in to carry weight on the back. This is very important, for if the mule once acquires a vice during the period of breaking, he can never be got to forget it and it will be a constant evil in the battery; above all at critical moments, when it is essential to load the mule as rapidly as possible this vice paralyzes and delays its movements and for want of a well broken mule it often happens that a load has to be left behind. The training should be gradual and all the more so, because naturally the mule is easily broken in and there are few who resist. Much calmness and gentleness are necessary; good treatment is half the training; blows, the use of the twitch, twisting the ears, and other violent means should never be resorted to. Men of violent and irritable temper never have the patience to fit them for this duty and have recourse to these barbarous ways of punishing the animals because they won't do exactly what they desire, very often from not properly understanding what is required of them. The fault therefore lies with the man and not with the animal. For example if he try to put the bridle on the mule and for this purpose seizes him violently by the ears, it is only natural that the mule should draw back his head and try to escape the pain he is suffering; then the ears are pulled harder and the mule resists more and more determinedly because he does not understand how and where the bridle is to be adjusted. If the animal is kindly treated and petted, he will lower his head and allow himself to be bridled with the greatest ease. Unfortunately these scenes and struggles afford pleasure to the spectators and the drivers are vainglorious of being able then to bring the mule into subjection, which is quite in harmony with the backward state of culture in Spain as regards the treatment of all animals, and the very fact that in other countries, but not in this, there exist societies for the protection of animals, proves how rare in Spain are compassionate feelings for the creatures that man makes so much use of.

Working steadily and without haste, ten days should suffice to break in the rawest young mule. If then it is desired to prove them,

and the packsaddle is put on the first day, out of 10 mules, 9 will allow it (not without mistrust perhaps), but one will probably refuse to allow it to be put on, and will give trouble the next time and for the future; this mule is the one to be avoided. The young mules will confide themselves to the gunners who have voluntarily undertaken to break them in and whose abilities for that purpose are known. During the first day they pass the hand over the mules back and down his legs, remaining a good time with them, caressing and making much of them and giving them some green forage or bread out of their hands. This part of the training is very essential because it gives the mule confidence in his trainer and the latter can do afterwards whatever he likes with him. The second day, the blanket is laid doubled on the mules back all being done quietly so as not to frighten the animal, the trainer then gives some pats with his hand on the blanket taking care all the time to continue petting and feeding the animal. If it will bear the blanket without mistrust, the third day a sack partly full of barley is placed on top of the blanket taking care that the mule sees it and knows before hand what it is. This should be repeated two or three times both at morning and evening. If any mule shews itself to be shy the bridle should be put on because it is never so frightened when that is on. The fourth or fifth day they get more reassured and accustomed to the unusual weight on the back; the pack saddle is put on. This pack saddle should be old or else of the circular (*redondo*) form supplied to some batteries, as good ones would be damaged occasionally by falls when flung off by refractory mules; the breast harness and breeching are detached from the pack saddle which is carried by two drivers and carefully placed on the mules back, so that no part may hit it; once put on, it is moved about gently to right and left, if the animal does not shew any fear of it, they proceed to girth him up with precaution and then if he will move a short distance without kicking or fighting against it, the mule may be said to be broken in to the packsaddle; once he takes it, the other parts are put on and he is then loaded with two sacks of barley or earth weighing about 3 qrs. or, cwt. each, making him walk about with them to accustom him to carrying weight. Finally to load him with the boxes, they are brought and placed on the ground in parallel lines and he is made to walk between them 3 or 4 times and in his sight they pull the boxes about a little and move the chains; if he be frightened at this noise, he must be pacified and caressed taking care that he does not retain any fear of them. A mule is easily frightened by noises or strange sights and is very slow to understand the circumstance and to perceive that it is harmless. He is on these occasions apt to bolt and thereby run into fresh dangers. It is therefore important to give the mule plenty of time to comprehend the cause of his fear. If in the first day the mule has both the pack saddle and cases put on him, it may happen that in moving, the noise of the load frightens him; he bolts, the load gets displaced, the cases fall and finally the mule gets injured; so that for the future whenever he sees a case, he imagines he hears the rattling of the chains and feels the load, expects the same result as before and eventually attempts to rid

himself of it in the same manner ; and until he is persuaded that they do him no harm he will continue the same habit.

If the mule absolutely refuses to carry the cases properly (which rarely occurs) the only thing to do is to take him to a piece of soft ground and load him there with two sacks of earth weighing 70 or 80 kil : ($1\frac{1}{4}$ and $1\frac{1}{2}$ cwt) each, then make him walk about in a circle until he gives in. This is sure to be successful in a short time. Blows however and violent means should not be resorted to.

It is not such an easy matter to accustom them to the crupper for some mules will never carry it, and no means have as yet been found out to make them take it. As an example, a mule who would not bear the crupper was subjected to different experiments to try and force him to it. He had a special harness made for him by which he had to carry the crupper without needing the packsaddle and he was left with this on a whole month, during which time he constantly kicked, especially when leaving the stable. All sorts of other ways were tried and at last they attached his tail to his testicles with a string. Even this extreme experiment did no good and he kicked all the same. Later on this mule went on active service, he went out loaded, but with the crupper tied up and after several days work of 10 to 12 hours, they let the crupper down and he then recommenced kicking as violently as at the commencement of his training. From this we may deduce that fear was not the cause of this obstinacy ; he was probably of a highly nervous temperament, and extraordinarily sensitive especially in that particular part of his body.

Some young mules cannot bear heavy loads partly from their training having been too much hurried and from their backs having been unduly strained. These must be loaded with light weights. There is a custom of loading mules excessively in order to keep their spirit under. This is very dangerous and often ends in damaging them for life.

Nevertheless occasionally awkward and vicious mules in mountain batteries have been got the better of and made to work. It is not many years since mules might be seen on days of reviews with the twitch on, put on before leaving barracks and kept on until their return. It is however very rare now to see mules led in this manner, good treatment should ensure the animal being on good terms with his driver. It is only by this means that the mules can be kept good tempered and well trained, and but few gunners would be injured in the care of them.

EQUIPMENTS AND PACK SADDLES.

Now that we have considered the training and loading of the mule, we will pass on to treat of the harness and appointments.

Bridle. In the mountains of Cataluña, the customs of which district have served as types by which to organize mountain Artillery,

the trader's mules have a bridle with a "*filete*" (a bit which acts on the under lip of the animal) and blinkers identically the same as are used in the mountain Artillery, though it is not very suitable for the *arrieros* (mule drivers) because one man has to drive a number of mules: this bit (*filete*) obliges the mules to walk with the head raised and prevents their turning easily, obliging them to keep the right direction and follow the leader which carries a bell: they also do not go to sleep or trip, are more careful in walking, do not linger by the road side to eat grass &c., because they cannot stretch their necks. This also prevents them from quarrelling amongst themselves. In the Artillery each mule has a driver who guides and leads him, independently of the others, in the wheels, turns &c., made by a battery at drill; the *filete* only subjects the mule in front, movements and its effect is *nil* in half turns; many resist having the iron put into their mouths; on long marches it makes the mules sweat if it keeps him very upright, and finally it is noticed that on service nearly all the drivers leave the *filete* out of the mouth proving that it is not really necessary. If the animals have to move quickly it is more important for them to have the full support of their feet on bad roads and the drivers caring for their mules and interested in their condition, like to give them occasionally a mouthful of grass from the roadside. It is thought by many that this bridle though very good for the droves of trader's mules, is not suited for the military mule which has frequently to form up in line accurately dressed and is always led by a man; it would be better to have a canvas bridle with a chain which used with the "*muserota*" (nose band of iron) would manage him better than a *filete*. This would be the same as is now used on the hand mule in the field batteries. Doing away with the 2 reins and buckle attached to the pack saddle, the mule would be led by the rein of the bridle only.

HALTER AND HEAD COLLAR.

The same as that used in Cataluña. The peasant who buys a mule procures a head collar to fit him but in the army these are all of one size and the small mule must wear the same head collar as the big one. The head piece gets much damaged by the mules biting each other in play. It would be much better to adopt the halter used in the Field Artillery which has much less leather about it and is simpler and more suited to the animals.

Head rope. If made of hemp it only lasts a short time as the mules gnaw it, similarly if of leather which moreover is expensive: if a Chain is used it is apt to break from time to time and has to be mended by a Smith, it weighs a great deal and is awkward to attach to the mangers. The best material would appear to be raw hide as it is strong, tough, cheap, and lasting; it can always be got also from the hides of mules that die, the strips being cut and dried by the drivers themselves and afterwards slightly greased, this latter precaution keeps them soft and prevents the animals from biting them. In Encampments chains are better.

Pack Saddle. Has ever attracted much study and attention from Artillery Officers and after experimenting with different patterns, that of 1874 has been adopted. It met with the entire approbation of the Committee and it would be difficult to surpass it

As it is so thoroughly understood by all Officers of the mountain Artillery, it is no use enlarging upon it beyond making a few suggestions as to slight modifications that might be advantageous and which are derived from actual observation, while constantly on the march or active service.

The Catalan pack saddle used by the mule drivers of Cataluña is much lighter and cheaper than that of the Artillery, as it weighs on an average 48 lbs. and costs about £ 2, this packsaddle constructed to carry small weights is not sufficiently strong for Artillery service for which it was necessary to increase the strength of the frame work to cover the two main curved pieces with iron, the ropes for the load were replaced by strong chains and hooks and for carrying the wheels, the arched trees of the packsaddle are specially constructed with a swivel bolt; all this extra strength and increase of weight demands an extra amount of wool stuffing in the panels; thus it is that the Cataluña packsaddle only contains about 12 lbs. of wool or hair whilst that of the Mountain Artillery, takes about 35 lbs. the total weight therefore is about 100 lbs. and the cost £10.

In the "*arriero*" packsaddle, the proportion of straw is greater than that of wool, and the reverse in the Artillery. It cannot be believed that the great quantity of wool is better or more useful; as a stuffing of this material after much use and sweating of the animal gets harder and more compressed every day, becoming almost like felt, always yielding at the points of greater pressure. The straw as an intermediate substance between the wool and the frame work, modifies the effect of the pressure from the small amount of compression it admits of; it becomes therefore a species of spring which resists and checks the caking or depressions of the wool throughout the length of the space between the panels. Moreover it is a bad conductor of heat and does not get heated like wool. By employing more straw, the weight of wool might be diminished by about 10lbs. This was occasionally done during the operations in Cataluña and with success.

The stuffing of the packsaddle must be suited to the different shapes of mules as far as possible.

The curved bars of the tree are apt to get broken especially at the points after the saddle has had many falls. In many towns the necessary wood for repairs (black poplar) cannot be obtained, and it would be a great advantage if the actual tree of wood and iron could be replaced by iron alone without increasing the weight of the saddle; repairs could then be easily made by the battery artificers.

The higher the load, either of gun or carriage the greater will the oscillation of the centre of gravity be felt, and the smallest carelessness on the part of the driver may cause the centre of gravity to fall without the circumference of the supports, the result being that the saddle will roll over and the load come to the ground; therefore the gun and carriage must be arranged as low as possible to counteract this tendency.

To sum up, the actual pack saddle is good and fulfils the requirements of the service. But comparing the effect of the Artillery and Cataluña saddles on the mule, the disadvantages are with the former partly owing to the special nature of the load and partly from the irregular and broken ground the battery has to pass over; and to lessen and modify the bad results we might suggest the following alterations.

(1) Slightly bending inwards the ends of the "*Camones*" or curved pieces of the frame.

(2) Widening the leather surcingle of the packsaddle by about 1 inch.

(3) Adding more straw in the stuffing of the panels over the shoulders.

(4) Lowering the C of G of the load of gun and carriage as much as possible.

All these are small corrections which though not absolutely essential still would perfect and give a finish to a work already nearly perfect.

CRUPPER.

This appears to be unnecessarily strong and might well be reduced in width by about $\frac{1}{2}$ at least which would secure a saving of about 1s-6d on each saddle.

GIRTH.

The girth has not much influence on supporting the load at the sides, but that passing round the centre of the gun and carriage is important to avoid and prevent vibrations of the load. One battery in particular experimented with fair success with a Y shaped girth, the two arms of which passed over the upper part of the packsaddle leaving between them the bar for carrying the wheel on, and were attached on the other side; the effect of this was to prevent any oscillation of the load to one side or the other, and to keep it perfectly steady. The mule could also be girthed up on the move. However these straps did not prevent girth galls, nor the necessity of using pieces of rabbit skin, from which we may presume that girth galls are not caused so much by the bad condition and adjustment of the girth, as by the movement of the packsaddle; and more often still by marching 4 or 5 hours up and down steep inclines and on a bad road.

When moving on a good level road neither the breast harness, crupper nor even the girth contribute to keep the load steady; but in mountainous and in uneven and rocky ground, it is necessary to have a certain equality between the strain exercised on the crupper and breast harness, this depends greatly on the shape of the mule and the nature of the ground he works on.

SADDLE CLOTHS (*Mandiles*.)

There is no doubt that these embellish the packsaddle when they are carried, but on account of their porous nature and small consistency they do not come up to what was expected of them. The Catalan packsaddles are deficient as a rule of the front cloth, but to make up for that the back is a great piece of leather joined to the rear arch of saddle, which covers not merely the loins of the mule, but part of the croup, thereby protecting the hinder part of the mule from rain and sun. When made of cloth the *Mandiles* get worn out by the friction of the ropes and only last a short time in the field, for which reason they may be condemned in the field, they being employed on grand occasions parades, reviews &c.,

Finally for several of the buckles of the packsaddle might be substituted straps and keepers of raw leather as used by the *arrieros*.

Buckles easily break and require careful repair. If for example any of the straps hanging from the crupper should break at the buckle, it is necessary to wait until the next halt before it can be repaired and meantime the load is imperfectly adjusted. By carrying several spare straps and keepers of raw leather, the driver can adjust a spare strap without delaying the march and thus secure the crupper.

One must not take it for granted that a section of mountain Artillery can be always in places close to towns where they can get all they want; all must be arranged as if they were in the field and in the poorest of Districts such as Tàhu, Orgañá Cor de Rourre or Caserras, in Cataluña; they should be prepared for any emergency that might occur in those places, and under the most unfavourable circumstances, remembering the main conditions of an efficient mountain Artillery viz: resistance, simplicity, and power to repair rapidly any damage.

BLANKETS.

The woollen blankets are better for the men than for the animals for which they are not much used in time of war, and they may be considered as part of the equipment of the driver. The regulation blanket has one corner strengthened with leather, through a hole in which the 3 other corners are brought, forming it into a bag in which to carry straw &c. This however soon wears the blanket out and it would be more economical to have a sack to each gun to carry provisions of all kinds in. The blanket being laid over the packsaddle gets much

damaged by the friction of the things over it, and the weight of the gun and carriage. The better way to carry it would be as in Andalusia, to roll it in front of the saddle and secure it by the centre, letting the ends hang down.

NOSE BAG.

That in use by the Sections of Mountain Artillery is very good but it is open to improvement. Some regiments of Cavalry have a nosebag the bottom of which is of leather perforated with holes and in the part which comes under the nostrils of the animal there are larger holes to assist breathing but not large enough to let the barley fall through ; also round the mouth of the bag is a string by which it is attached to the horse's muzzle, it serves as well to draw the bag together and prevent the feed from falling out on the march. This nosebag is expensive but it lasts longer and is superior to the regulation one. On the march it is carried on the saddle and contains brushes and cleaning traps and is exceedingly useful. It is carried on the near side of the front arch and its weight and the motion makes it knock continually against the edge of the arch and in the end it gets broken. With a little care it might be adjusted so that it should be steady and thereby it would last much longer.

IV.

THE ZULU COUNTRY.

PREPARED IN THE INTELLIGENCE BRANCH OF THE QUARTER-MASTER-
GENERAL'S DEPARTMENT HORSE GUARDS, WAR OFFICE.

GEOGRAPHY, &c.

ZULULAND lies on the East Coast of South Africa, north of the Colony of Natal, and is, roughly speaking, about 15,000 square miles in extent.

BOUNDARIES.

To the south flows the Tugela, a large and important river (un-navigable) as a boundary between Natal and Zululand, and to the east the country is bounded by the Indian Ocean.

The boundary between the Zulus and the Tongas (a tributary tribe residing on their north-eastern border) is also undefined, but is not a subject of dispute.

To the north the River Pongolo (or Maputa) forms the boundary—now a disputed point—beyond which lies the Swazi country. On this the Zulus have greatly encroached, and there are now at least 10,000 living over the Pongolo.

The western boundaries, separating Zululand from the Transvaal, are also disputed, *vide* the map.

FEATURES OF THE COUNTRY.

The physical features of Zululand very closely resemble those of Natal, the land rising in three terraces from the sea level. The immediate coast line is low, sand hills and scrub forming its main features. This coast line, which is bushy, hot and unhealthy, is interrupted by swamps and lagoons, caused by the sluggish habit of the rivers as they near the sea. Being unable, owing to their sluggishness to clear away the bars at their mouths, they spread themselves over the low-lying coast district and cause malaria. This lowest plateau is not only more fertile, but more capable of cultivation than the coastlands of Natal, and is well adapted to become a great sugar producing district. In

many places a plough might be put in and a furrow driven in a straight line for miles without meeting an obstacle.

A few miles from the sea the country begins to rise and forms the second terrace. This terrace consists of broken ridges, and is very hilly, but well adapted for the grazing of cattle. Here also the soil in many parts is capable of cultivation.

Beyond this midland tract westwards towards the interior, a high rolling upland is reached, continually intersected from east to west by deep watered gullies, and dotted over with little conical hills, some 3,000 feet above the sea.

From Rorke's Drift the country on the Zulu side of the Buffalo and Tugela Rivers is mountainous, several of the hills rising 2,000 feet or more above the level of the river which washes their base, and the country towards the mouth of the Tugela is so rugged that only in a few places do even natives attempt to cross.* From Rorke's Drift (ford) upwards, the Buffalo has open banks.

A great part of the country, both hill and vale, is grass land, the valleys or kloofs, in some cases being bare, in others covered with bush, whilst on the highlands, in places, forests exist in considerable quantity.

FORESTS.

There are extensive forests of large timber in the country. Yellow wood and other valuable trees are abundant.

In the portion of the country through which the Utrecht-Ulundi road runs are two forests, one to the N. of the Ityentika Mountain, and one to the S. E. of the Inhlazatye Mountain.

A thick bush consisting of mimosa and baccombecchi (wart-ein-bitche, or wait-a-bit) runs along both sides of the Black Umvolosi, the Itaka and White Umvolosi Rivers.

This bush resembles in most particulars that surrounding King William's Town, while the formation of the country where it exists only differs in being more stony, and as a rule less broken.

An extensive forest (the Qudini) exists on the left bank of the Buffalo and Tugela Rivers, near their junction.

There is generally a thin bush to be seen on the lower slopes of the mountains.

MOUNTAINS.

The mountains of Zululand are few and unimportant. Intabankulu, Eloya, Inyoni, Inhlazatye, Munhla and Ishilalo, may be called

* Rev. G. Blencowe

mountains. All these lie towards the north and north-west of Zululand, and none of them perhaps exceed an elevation of 6,000 feet above the sea.

The Inhlazatye Mountain is stated to be the most prominent in Zululand. It is well wooded, and supposed to be 6,000 feet in height.

From the "Ingqutu" Mountain, one of whose tops is called "the neck of the little Elephant," an extensive view of the country is obtained.

The sources of the Umlatoosi River are in the "Ibabanango" Mountain.

The Ngabaka Hawane is a branch of the Drackensberg and the source of the White Umvolosi River.

The "Ungoya" range runs to the south of the Umlatoosi River and to within a few miles of the sea it is covered on its summits and along the numerous watercourses on its southern slopes with thick forest, producing excellent timber for building purposes.

Mountains and Hills along the Utrecht-Ulundi Road.

The hills and mountains are all table-topped. They rise suddenly from the plains, their lower slopes are covered with loose stones and thin bush. Their upper slopes consist of boulders and crags. From their bases watercourses, with steep banks from 12 to 24 feet high, radiate in all directions. All these mountains can be ascended in any part by infantry, and nearly anywhere by cavalry and mountain guns, with the exception of,—

(1.) Inhlazatye Mountain, the summit of which can only be ascended through a thick bush on the south side. This mountain covers a vast extent of country, has much thorn-bush over it, and is very broken and steep. The road past it runs along a narrow ledge with a precipice on one side, and on the other huge boulders interposed with bush, euphorbia trees, cabbage plants and cacti. There is good water here crossing the road.

(2.) The Ishilalo" or "Seat" Mountain whose summit is an inaccessible crag. There are small streams running from the lower slopes but these run dry except after rains. It is an almost solitary peak, accessible from the N. E. side but very steep indeed. To the N. E. of it lies a considerable tableland looking down into the great thorn valley of the Black Umvolosi, accessible by a somewhat difficult wagon track scarcely practicable for artillery.

RIVERS.

Zululand is very well watered, rivers and rivulets being numerous, and of these, excepting the Tugela, the Umvolosi is the most consider-

able. None, except perhaps the Maputa, can be described as navigable, though some of them may be so for small boats. During the rainy season, September to March, they are full, and some are difficult, others impossible to cross when in flood, their beds being either rocky or full of boulders, and their current swift. In the dry season, March to September, they shrink into insignificant channels amongst the sand and boulders of but a few feet in depth.

In the rainy season not only the river beds but often their immediate neighbourhood are subject to severe and excessive floods. At such times Kafir bodies, huts, oxen, sheep, trees, crops, &c., may be seen rushing down upon the flood. A thunderstorm in the hills will in a few hours inundate for miles down the immediate neighbourhood of rivers having their sources amongst the hills. During the floods of November and December 1874, every coast bridge in Natal was carried away, and this would have been the case in Zululand also, had there been any bridges. The worst floods occur after a three days' rain, which happens occasionally, but very rarely, in the midst of the dry or winter season. The ground being then exceedingly dry and hard absorbs but little of the rain which runs off the surface of the earth as from a pavement.

The river mouths are invariably closed by a sand-bar, in consequence of which there are numerous lagoons all along the coast, the largest of which is the St. Lucia Lake.

In wet seasons, unless the rivers rise sufficiently to sweep away the bar, the whole adjacent district near the coast becomes one vast morass.

The banks of the rivers are, as a rule, clothed with high and thick reeds.

During the summer the rise in the rivers is great and rapid. The Buffalo has been known to rise 10 feet in a few hours, and when it enters the Tugela that river having already received the Sunday's, Klip and Mooi rivers, has taken the drainage of the entire basin of the Drakensberg from beyond Wesselstroom to 20 miles below Giant's Castle, so that a rise of more than 30 feet is common as it rolls down between its mountainous banks.

Tugela River.—The Tugela, by far the largest river, descends from its junction with the Buffalo river to near its mouth in a succession of shallow rapids and pools, and a mile or two from its mouth it spreads out over a broad expanse of sand, out of which it scoops new channels for its stream every time it is in flood, so that to cross the stream when the waters subside a new path has to be formed. In the channels along which the water runs may be found holes from 10 to 20 feet deep, while other parts are only six inches deep.

The Tugela flows through a wide and broken valley of considerable depth, and it has been known to remain in flood for six consecutive weeks. Its mouth is closed by a sand-bar, on which, with a sea breeze, the surf, breaks heavily. The river inside the bar was about half a mile wide in August 1873.

The Umzinyati, or Buffalo River.—Average width * 120 feet, flowing in one unbroken stream. Current slow, it has steep banks of sand and rock, bottom of sand. Fifteen feet rise when in flood—rises quickly, falls slowly, has many fords. It flows into the Tugela.

The Blood River.—A tributary of the Buffalo; average width 30 feet. Its course alternates between shallows and pools, its banks are high, the current swift, the bottom consisting of sand and flat rocks. There are but few drifts. During the summer it is subject to constant floods, which rise rapidly to an average height of 10 feet and fall quickly. It can be crossed almost any where except when in flood.

Black Umvolosi.—For the first 20 miles of its course is a rapid mountain torrent, it then changes to a wide shallow river, flowing through a bed of sand with low sandy banks easily crossed anywhere though it has numerous quicksands. Average width 120 feet, subject to sudden floods, but falls quickly. Thick bush on both banks.

White Umvolosi.—A rapid river varying in breadth from 60 to 120 feet, running through a sandy bed, with low sandy banks, fordable at nearly any point, quicksands dangerous after a flood. It rises 10 feet when in flood to which it is subject. In its lower course it has thick bush on both banks. This river, where crossed by the central road, from Tugela to Ulundi, is about 50 yards wide, and from 1 to 1½ feet deep in the dry season. It flows over a sandy bed, with easy approaches.

The valleys of both the Black and White Umvolosi are unhealthy. They unite about Amanzekanze to form the Umvolosi, which flows into St. Lucia Bay.

Insegene, or sand River.—A shallow stream 60 feet wide running through the middle of a bed of sand, with low banks of sand. It is liable to sudden floods. It can be forded anywhere, except after floods, when it is dangerous on account of quicksands. A safe passage can, however, be made by sending over large herds of cattle to beat down the sand. This river runs dry in hot weather, but water can be obtained by digging in the sand of the river bed. It runs into the White Umvolosi.

The valleys of the Umvolosi, Umlatoosi, and Tugela Rivers are broken and covered with grass and dense thorn bush. This is eminently the case with the valley of the Tugela, which is excessively

* The width of the rivers given is that which they have under normal conditions.

broken, densely clothed with thorns, and in some places over 3,000 feet deep.

Umlalona.—A mountain torrent running over a bed of rock and sand, it runs dry during the winter. It is a tributary of the White Umvolosi.

Itaka.—A swift stream liable to run dry. It runs over rock and sand. It is a tributary of the Black Umvolosi.

Amatikulu.—This river is from 15 to 20 yards wide in the dry season, where it is crossed by the road leading to Ulundi from the lower Tugela, and of considerable depth. It runs in the lower part of its course through a deep, rich alluvial bottom, suitable for sugar. It fills very rapidly in rains, rising suddenly. It flows into the sea about 15 miles north of the Tugela.

Umlatoosi.—A river which flows into the sea north of Port Durnford. It has a sandy bed, about 50 yards wide and 2 feet in depth in dry season, with easy banks where crossed by the above-mentioned road, filling up in the rains to about 150 yards in width. The valley through which it runs is most unhealthy near and below the central road, and bearing also, during the summer season, grass, stated to be poisonous. At all events, during these months it is inimical to horses and cattle, while during the winter months it appears innocuous. In this valley there are large tracts of thorn bush.

GEOLOGY.

The Geological formations of Zululand are very similar to those of Natal, which has shale preponderating on the coast, old sandstone in the second step and in the highest parts a deep deposit of new sandstone, capped with Basaltic trap.

In the neighbourhood of the lower part of the Buffalo near its junction with the Tugela there are indications of great igneous disturbance at an early period, but the latest deposits are entirely undisturbed.

The character of the mountains generally is granitic.

There is no limestone; ironstone exists in great abundance all over the upland districts. Sandstones of various coarseness, shales, grit, and soapstone are largely disposed through the country.

Quartz, some of the purest whiteness, and many coloured spars are found in great quantity towards the Pongolo river.

Good brick earth is very general, and fine clays for pottery work exist probably in many places, certainly near Munhla Mountain where coal has also been obtained.

HARBOURS, ROADSTEADS, AND LANDING PLACES.

THERE are no harbours or landing places upon the Zulu coast. If roadsteads exist they have never been used, and there is no communication by road or track from any part of the coast inland.*

From Natal to St. Lucia, a distance of about 109 miles, but little is known of the coast.

Many small rivers appear to discharge themselves into the sea, but they are in all probability blocked up during the dry season.

Tugela River.—This river inside the bar was, in August 1873, about half a mile wide. "It seemed well sheltered and deep, and, were it not for the bar, would seem to be a good haven for small vessels. A passage was observed through this bar at its eastern end from the adjacent heights, and it is possible that, under certain conditions of weather, flat-bottomed surf boats might be brought in." From the reports of Mr. E. F. Rathbone and Mr. H. W. Taylor, there appears to be a practicable landing-place near the mouth; the writers, however, differ as to the exact spot. The full reports in question will be found in a Parliamentary Paper, "Further Correspondence respecting the affairs of South Africa." C.—2079. July, 1878, pp. 67-69.

St. Lucia Bay, N. of Cape St. Lucia, is entirely exposed to winds from seaward between N.E. and S.W. After a N.E. or E. wind, a swell rolls in and causes heavy breakers on the beach, thus rendering landing impracticable in ships' boats; communication with the shore while these winds are blowing would have to be made with decked surf-boats. The breakers appear to be heavier here than on the coast south of Cape St. Lucia. This bay is just within the fever belt, which makes it unsuitable for Europeans during the summer months.

St. Lucia River.—This river, in the dry season, is completely blocked by a bar of sand which is annually swept away by the flood. It may, however, be sufficiently open at times for loading merchandise. Mr. Consul McLeod in 1857 describes St. Lucia as a *port* admirably adapted for throwing supplies into the Zulu country.

At the time of H. M. S. "Nassau's" visit in the early part of December, 1875, the mouth of the St. Lucia River was completely blocked up by a bar of sand, apparently of such thickness as to render it doubtful if it could be swept away by floods; but probably, during the rainy season, the river may become sufficiently flooded to open a channel for boats.

* *African Pilot.*

Coast Line.—The coast north of the river consists of low sandhills gradually rising into a series of hillocks, as Cape Vidal is approached.

The coast from Cape Vidal to Inyack Island 130 miles, consists of a continuous line of sand hills from 50 to 500 or 600 feet high. There are a few straggling black rocks along the shore.

Kosi River.—Kosi River appeared to be navigable for small vessels and to have a large lagoon inland.

Delagoa Bay.—Delagoa Bay is the only good harbour for large ships between the Cape of Good Hope and Mozambique. The depths in Delagoa Bay vary from 6 to 12 fathoms, all good anchoring ground; there are, however, some spots of 20 fathoms or more between Cockburn Shoal and Shefeen Reef where the channel for large ships is contracted to 4 or 5 miles. A bar extends partly across the bay.

The best and only safe channel for a large ship in the absence of buoys to mark the other channels, has not less than 9 fathoms, and runs between the shoal called Cutfield flat and the shallow ground extending from the shore. This channel is about $1\frac{1}{2}$ miles wide.

Within the bay the English River and Port Melville are also available as ports.

English River.—English River affords an excellent landlocked harbour. The shores are low and wooded. The bar has 14 feet at low water, and 25 or 26 at high water springs.

Port Melville.—Port Melville is a very good harbour for all winds, far better than English River for refitting or reprovisioning on account of the unhealthiness of the latter.

COMMUNICATIONS.

ROADS.

THERE are no roads, properly so-called, in Zululand. The tracks are made by traders taking their wagons into the country.

No communication by road or track exists from any point of the Zulu coast inland. Two or three Norwegian Mission stations lying here and there near the coast, are connected by wagon tracks with the main tracks through Zululand.

Three wagon-roads lead into Zululand from the Tugela, two from the Tugela Lower Drift, and the third from Rorke's Drift.

From the Tugela Lower Drift one road leads along the coast to Delagoa Bay. It is connected with the centre road to Ulundi by a cross one, following the course of the Umlatoosi. The third road, from Rorke's Drift on the Buffalo River, also leads to Ulundi. All these roads are fairly good.

To avoid the numerous deep ravines and valleys, the centre and upper roads follow as far as possible the water-shed lines, which, in places, form narrow necks or saddles easily rendered impassable.

Another road (*vide* Report A.) runs from Utrecht to Ulundi, crossing the Blood River and tributaries of the White Umvolosi.

The march of troops through the country would, on account of its generally broken nature, be to a great extent confined to the roads.*

Tugela Lower Drift.—The ford of the Tugela (called the Tugela Lower Drift) common to both the roads which here enter Zululand is within two miles of the mouth of that river. From the advantages which this ford possesses it must always be a point of the greatest strategical and commercial importance. This ford is at present worked by a punt in the rainy season, by which wagons and goods may be transported from one side to the other. Horses and oxen at such seasons must swim the river.

A few miles after entering Zululand the tracks diverge; one keeps the low coast district through the bush country to Unodwengo, the late King Panda's kraal (*vide* Report B), and the other runs up into the highlands to the westward and branches down to Unodwengo. The main track, however, goes on northwards to the German settlement

* The Utrecht-Ulundi road would appear to be an exception *vide* Lieutenant N. Davis' Report).

of Luneberg, on the Pongolo, and by many routes into the Swazi land and the Transvaal.

Smaller tracks branch from these two main tracks throughout their entire course to various Mission stations, and notably two westwards, near the Intabankulu, one to Rorke's Drift upon the Buffalo River, which leads to Ladysmith in Natal, and the other to the town of Utrecht (*vide* Report A).

Besides the road to Ulundi from Rorke's Drift a second road runs north-east (according to the report of a native of the country, confirmed by others), crossing the White and Black Umvolosi Rivers. The country along this road is mostly open until the valley of the Black Umvolosi is reached.

The itinerary of this road is as follows, the distances being judged by the time it would take a native to walk (season not stated):—

Places.	MILES.		Remarks.
	Inter.	Total.	
Rorke Drift (cross two streams).	...	...	Road said to be good ; Sirayo's kraal 2½ miles to the right.
Income R. . .	7	7	Open country ; no cover at the drifts.
Babamnago R. . .	12	19	Ford good. Shortly after the Drift, Umkonomo's kraal passed two miles to right.
Egotoco R. . . .	13	32	Good ford. Sigotwoyo's kraal to left.
Road to Lower Tugela.	...	...	This road passes Ingwasi's kraal about 17 miles distant.
White Umvolosi R.	10	42	Good ford. Stream wide, but shallow.
Black " "	16	58	Ungoloti Forest, a mountain district, is said to commence about 45 miles right of road between the Black and White Umvolosi, filling up the country between them and extending nearly to the coast.

Another route is described as running from the Utrecht District to the Lower Tugela, crossing the last route near the White Umvolosi, and following the course of that river for some distance, then probably leading by Dingaan's old Kraal into the central road from the Lower Tugela.

The description of these two latter roads has been furnished by Colonel Bellairs, who further adds: "From Rorke's Drift a good route could probably be formed to Qudini through open grass-land, making a slight détour to avoid the almost impracticable Qudini Forest."

All these tracks are bad, especially in the hilly parts of the country, and passable only for ox-wagons and ox-carts but not for light horse-drawn carriages. Perpendicular drifts of sand 20 to 30 feet high, have

to be cut down after every considerable flood before the fords become again passable. During the rainy season, many of these fords are impassable for weeks together. The upper road from the lower Tugela Drift is at such seasons to be chosen rather than the lower one, as it crosses the rivers where they are younger and narrower than they are near the coast.

Good strong horses can be swum over all these rivers in almost every state of flood by an experienced rider.

The roads into Zululand from Delagoa Bay and from the port north of it must be tolerably good, as enormous quantities of arms are reported to have been carried into the interior by them (*vide* Section H).

The Portuguese Consul at Pilgrim's Rest, in a report dated 1st August, 1878, speaking of the communications of the Port of Inhambane (5 days north of Delagoa Bay), with the interior, says: "For your further information I may remark that the Port of Inhambane is very easy to reach for the Zulus *good paths, with plenty of water* leadings, to it, and through territory; occupied only by subordinate and, to Zulus, friendly tribe."

REPORT A.

Notes from a Report on the Road from Utrecht to Cetjwayo's head kraal "Ulundi," by Lt. Newenham Davis, the Buffs; from information obtained from Mr. Rudolph, Landrost of Utrecht, and also from a Memorandum on the same, by the Hon. W. Drummond.*

General Character of Country.—The country between Utrecht and the Ulundi Kraal consists of large rolling plains interspersed in all directions by dongas or watercourses, which radiate from the bases of the table-topped mountains which rise at intervals throughout this portion of the country.

The watercourses are, as a rule 12 to 14 feet deep, and the country is well populated.

Roads.—The main road from Utrecht to Ulundi; also the by-roads, are wagon tracks only; these roads are generally good, the soil being sandy and allowing the water to drain through easily. Artillery could easily be moved along the entire length of the road, except during wet weather, not to be anticipated in winter, which would render many portions of the road temporarily impassable. Wagons could pass each other at any point of the road with the exception of that portion leading across the Inhlazatye Mountain which runs along

* Spelt phonetically in the Natal Précis, "Ketchwayo," but in recent official communications it will be found spelt as above.

a narrow ledge, and where it ascends the Intendeka tableland, where the ground on either side of the road is too stony to allow the passage of any wheeled conveyance. Columns of infantry and mounted troops could move alongside the road everywhere with the exception of the pass over the Inhlazatye Mountain.

The road from Utrecht to Ulundi skirts the Intendeka tableland, and then descends into a valley with bush for 10 miles, and then ascends a tableland which overlooks the Umhlabatini plains, and from which the military kraals are commanded. This plain is stated to be unhealthy for horses and mules in summer.

Before reaching Ulundi and the district where the greater part of the military kraals are situated, there is a bad double ford across the white Umvolosi in a thorn bush country. This road is commanded by the Inhlazatye and the Ishilalo or Seat Mountain (*vide* Sect. R).

Kraals.—There are knots of kraals all along the road at short intervals with the exception of that portion between the Inseke and Inhlazatye mountains, where there are hardly any.

Each kraal contains from 8 to 15 huts, and each hut would hold from 10 to 25 men. There is a cattle enclosure in each kraal made of wood. These kraals would undoubtedly be burnt by the Zulus in case of an invasion.

REPORT B.

Notes from a Diary with Sir T. Shepstone's Escort to Cetywayo's Coronation in August 1873, by Capt. Davey, Natal Volunteers, and of a Memorandum on the same by the Hon. W. Drummond.

Lower Tugela Drift.—The Lower Tugela Drift is good, water shallow and bottom sandy; the south bank is lined by hills, upon one of which, just on the left of the wagon road, are the remains of an old fort. These hills command the opposite bank within rifle range. Along the bank is a narrow flat with a good deal of cover, such as small bushes and reeds, widening into reed beds in the gullies at the foot of the hills. On the north bank the ground is almost flat, gradually sloping up to gentle hills, at a considerable distance from the river and with little or no cover.

Two miles beyond the river was found a good camping ground with water.

The road to Inyoni River is good, but in wet weather would be very heavy for wagons, especially three miles south of the Inyoni, where there is a large mud hole. There was no water met with, but the numerous Kafir kraals within sight on either side indicate water in the neighbourhood.

The country is very open, affording no cover excepting between the mudhole and the Inyoni, where there is a gully with thick bush, on the left of the road, but this can be easily examined.

Inyoni River.—The Inyone is very brackish and disagreeable and the horses refused to drink it. Camping ground one mile north of the Amatikulu.

Umsundusi River and Amatikulu River.—The Umsundusi River is particularly sweet, and that of the Amatikulu very good. The road all along good and through park-like country.

Thorn Bush Country.—North of the Umsundusi the thorn country is entered, and careful patrolling is necessary; kraals are to be seen on either side of the road. Road thence to Inyezane is good, but there is a mud gully south of Inyezane, and several places which would be very heavy after rain.

The country is mostly open, but there is considerable cover in places; kraals on either hand.

Near the Umkukusi stream is a hill. The country beyond Inyezane is very broken and hilly and the road bad; one of the guns was capsized.

One mile and a half south of the Emlalazi River is a capital camping ground with wood and water.

From the Inyezane a range of hills has to be passed which should be avoided as camping ground in wet weather for wagons, as trekking with loads would be impracticable, and no water was seen. Beyond these hills the road passes through an open country thickly dotted with bush and capable of covering a large force.

The ascent from the Inyezane to the top of the Tyoe range is long and steep and has many exceedingly bad bits. On the top is an almost level tableland dotted with heavy timber forest, some of great size.

Here is the Tyoe Mission Station, with good buildings, easily defensible.

This tableland continues until the Umlatoosi Valley is reached, the road being very good.

Just before reaching the valley a wagon road branches off to the right, leading to Ondine, one of Cetywayo's principal kraals, and connecting the upper main road and the coast road.

The descent into the valley is steep and the road surrounded by dense thorn bush.

Umlatoosi Valley.—The march from Kongella, where the escort encamped, to St. Paul's Mission Station (10 miles) occupied the wagons 9 hours, and it had to be accomplished in one trek, as the grass in the valley is said to be poisonous to horses and cattle. The whole of this valley is very broken and full of thorns and bush, affording unlimited cover, but the bush is not very heavy and not difficult of passage by skirmishers, very few kraals to be seen. One or two streams near the road, with good water.

The Umlatoosi Drift is good, but the opposite ascent very steep and heavy and required two spans of oxen to pull the loaded wagons through.

On the return march 36 hours were spent in this valley without any ill effects on the cattle or horses, the grass appearing very good. This was at the north side of the valley. The grass may be poisonous at certain seasons of the year only.

St. Paul's Mission Station.—From the Umlatoosi the road runs for 12 or 15 miles through an open but rather broken country, the road being bad in places when the English Mission, St. Paul's, is reached, a strong and easily defensible position. Here the party encamped. The hill leading up to the station from the valley is very steep and delayed the wagons considerably.

From the Mission Station the road winds eastward and is at first broken and hilly, two spans of oxen being required in one place. There is a large hill, called Inguengue, on the right which commands the road for a considerable distance. On nearing Umbucungune, where the night was passed, the road is not so rough, and there are kraals on either side. A large range of hills lies on the left, named the Entumeni. Country exceedingly bare, scarcely any grass.

The march was continued for 10 miles next day, encamping for the night near Kwamagwasa. The country presented no cover.

Norwegian Mission Station.—On the Uvulu stream is a Norwegian Mission Station, whence the road leads up the ridges of a high range of hills with water on either side in the valleys.

The Kafir kraals are perched up on the highest points as if for the purpose of observation.

Camp was pitched for the night on the south side of the Magnibonium, on a small plain with good grass and water on the right but no wood. Country not quite so barren, but no trees.

Thence marched to Umhlabatini (where encamped for a week), 1 mile beyond the Emtonjaneni, and just in the entrance of the thorn country. Road good and the country open, but in front, very broken and covered with thorns, scrub and aloes. Water 1 mile from camp, but no camping ground could be found nearer to it. Several

kraals in sight. About 6 miles to the left are the remains of Dingaan's kraal.

Mr. Drummond writes:—" It (The road) then turns eastward over a level tableland for another 20 miles till the edge of the plateau is suddenly reached, and the road descends abruptly into the great thorn valley to the west of the White Umvolosi. At the edge of the plateau the coast road joins. (This abrupt descent is called the Emtontaneni in the Report; but is evidently not the place of this name marked on the map).

Umvolosi River.—From this, Emtontaneni, the escort marched 12½ miles and encamped on the north bank of the Umvolosi River. The road is very good, but passes through a thick thorn bush, and the country is very broken and full of thorn and small bushes, and contains several streamlets. The Umvolosi Drift is good, and is commanded by a high stony hill upon the north bank to the right of the road, within rifle range, on which stands a large military kraal. There is plenty of thorn bush cover on both banks, which however cease here, and the road passes through an open and level country for some three miles to a Norwegian Mission station (not defensible) on north bank of a small stream, just beyond which camp was pitched.

All round here for several miles are the principal military kraals including the new one in the thorn-bush to the S.E., called "Amanze-kauze" or "let the enemy come now."

The country round the mission station is very open, much cut up by deep dry watercourses, and with a little scrub here and there. The water in the stream was fairly good.

NAVIGABLE RIVERS.

*Maputa River.**—The Maputa River is said to be navigable for 60 miles from its mouth, and at high water a depth of 5 fathoms is found through the channels in the flats all the way into the river.

For the first 12 miles the banks are of low alluvial soil, and lined with forests of mangrove, but further up, the country becomes more open. The "Cockburn" tender, drawing 8 feet, ascended up 20 miles and ships' boats explored as far as 40 miles from the mouth of the river, but they did not proceed any further on account of the fever which attacked the crew. The current was strong in the river, but the tide ascends some miles, and enables the vessel to beat against a strong wind, although the river is everywhere narrow, and its navigable channels still more so. The mosquitoes at night were intolerable.

* African Pilot.

FORDS.

The drifts or fords are as a rule good when the rivers are low, and even when in flood long detentions are not likely to occur in ordinary seasons, except at the Tugela River.

THE TUGELA RIVER.

Tugela Lower Drift.—The stream in August 1873 was from 100 to 150 yards wide, and between $2\frac{1}{2}$ and $3\frac{1}{2}$ feet deep, with a sandy bottom, heavy in draught for loaded wagons. The drift is perpetually shifting, and quicksands are occasionally met with. On the Natal side the approaches are bad in the wet season, passing through a boggy flat some 400 yards in width before the river is reached. On the Zulu side they are fair. The width of the river in flood would probably be 300 yards. The ferry-boat is capable of taking a loaded wagon in one trip and the oxen in a second trip.

Kranz Kop, or Middle Drift.—Near Fort Buckingham. Approaches fair on both sides.

Besides these, which are wagon drifts, there are numerous places where cattle and horsemen might cross in dry weather.

THE BUFFALO RIVER.

Meyer's Drift.—Approaches steep on Natal side, easy on Transvaal side—shallow water, sandy bottom, passable for all arms except when the river is in flood.

Foot Pad Drift.—Approaches easy on both sides. sandy bottom passable for all arms.

Landman Drift.—A bad drift, approaches heavy and sandy on Transvaal side, very steep on Natal side, sandy bottom.

Lafus Drift.—The best on the river, approaches easy, bottom sand, passable for all arms.

Rorke's Drift.—Said to be a good drift, but in summer the current is apt to be so strong as to prevent oxen from crossing even when otherwise the depth would not be too great.

There are several places about Rorke's Drift and within three miles of it where this stream is narrow and slow enough for the working of a punt.

THE BLOOD RIVER.

The fords on the Blood River are all good, with easy approaches sandy bottom, and are passable for all arms.

Laas Drift is the best for any one going from Utrecht to Zululand; sandstone bottom, width about 10 yards.

OTHER RIVERS.

The drifts on the Insek and White Umvolosi are broad and sandy, with easy approaches, and very shallow.

With the exception, perhaps, of the lower parts of the Umlatoosi and the Umvolosi rivers on the lower road, there would not be long detention on the banks of any stream in the Zulu country, even in the summer.

TOWNS AND SETTLEMENTS.

KRAALS.

The king's, princes', and great chiefs' kraals are all protected with high wooden stockades, pierced here and there with small low entrances large enough to admit one person at a time; the isigodhlo or inner enclosure, where the chief huts are situated, is guarded by zigzags of the same description of stockade work, very strongly put together.

Military Kraals.—There are about 20 military villages or kraals scattered through the country of from 400 to 3,000 huts each, in which for a portion of the year the troops are quartered, averaging 2,000 men in each. There is known to be a military kraal about three miles north of Rorke's Drift; there is also a large military border kraal to the south-west of Iteleze, on the last hill in the direction of the lower drift of the Tugela.

Military kraals are used by the Kafirs only as barracks, and are not fortified. They consist simply of a dry stake and wattle fence, generally oval in form, and about 5 feet in height; inside this fence are the huts of the men in single, double or treble rows according to the size of the kraal; inside the huts is another fence similar to the one outside; the central space is the cattle pen.

The king's kraal is at Ulundi, it is 500 yards in diameter, and is garrisoned by 3,000 warriors. Ulundi is situated in the Umhlabatini plains, 15 by 20 miles in extent, and which is completely shut in by hills studded with thick bush. The White Umvolosi runs through this plain, in which are also established the principal Military kraals which form the head-quarters of regiments. In these kraals a large number of regiments are assembled annually to celebrate the great national festival. In the middle of the cattle pen the *mealies** are stored in holes.

The King has had a new magazine built about 15 miles from Ulundi, at the junction of the Black and White Umvolosi Rivers. This magazine and kraal is named Amanzekanze, and is surrounded by a dense bush, into which the Zulus would probably retire in case of defeat.

Ordinary Kraals.—Ordinary kraals contain some 8 to 15 huts, each hut could hold 10 to 15 men. Inside each kraal is a fenced cattle enclosure.

Kafir Huts.—Kafir huts are healthy and comfortable sleeping places, a grass native mat being spread on the floor.

* Indian corn.

Mission Stations.—There are about 20 missionaries and 20 mission stations, English, German, and Norwegian, in the Zulu country. Mission stations are generally solidly built one-storied houses of stone and brick with thatched roofs, and surrounded by outhouses, church &c. The position of most of them is marked on the map.

CLIMATE AS AFFECTING PRODUCTIONS AND HEALTH.

CLIMATE.

The climate of Zululand is in many respects a counterpart of that of Natal, but as it lies nearer to the equator, the temperature is somewhat warmer.

COAST LAND.

The low terrace and along the coast is moist and not over healthy, fever and malaria being to be dreaded in some parts, as for instance about St. Lucia Bay.

A gentleman, late a missionary in the country, says that "all the country to the north of the Umvolosi River, and below the mountain is unsafe for Europeans, except in the months of June, July, August, and in late seasons the early part of September. The hunters who have stayed in this part after the time above specified have generally taken the fever, which in five cases in six is fatal. Every other part of the Zulu country is as salubrious as Natal."

Climate of Natal.—Quoting from the *précis* on Natal, it would appear that the climate of the coast of that colony is warm, moist, and equable. The uplands, with a lower mean temperature, experience greater extremes of heat and cold. The range of the thermometer is as follows:—

	Durban (coast).	Maritzburg (upland).
6 Winter months	90°—40°	95°—29°
6 Summer months	95°—50°	97°—42°

Prevailing Winds.—During the winter a fresh S.E. wind blows almost constantly during the middle of the day in the inland region. In the morning and evening there is generally a gentle wind from the W. or N.W. In summer time, as a rule, a fresh wind from the S.E. blows over the midland district in the middle of the day.

Every now and then a hot wind blows over the land from the N.W. As a rule these South African siroccos begin in the early morning and blow until the afternoon.

The hot wind rarely reaches the coast districts.

From December to March the wind is often E.N.E. or N. by E., with a good deal of dampness and haze. There is an impression that these winds bring fevers and other forms of sickness.

Seasons.—The winter is the dry season, the summer the damp.

The winter season extends from March to September, and the summer from September to March.

Rains.—During the six summer months, 4 inches of rain per month fall, and the fall is distributed over $15\frac{1}{2}$ days. The mean fall throughout the year is about 30 inches.

Droughts are unknown, and floods are common in summer

Storms.—In the warm season, violent thunderstorms are frequent. Immense quantities of electricity are discharged, and the rain falls so copiously that the large rivers are rendered unfordable for many weeks.

Health.—The climate of Zululand being semi-tropical, the usual precautions to maintain health in such a climate must be taken.

Bivouacks.—With regard to bivouacking, a former inhabitant of the country says: "Never pass the night either on a very low or wet situation, on account of fever; or on a hill-top, on account of thunderstorms. Mark the position of Kafir kraals, and take a lesson from them in these respects. Always avoid the neighbourhood of a river that has been lately flooded.

Snakes.—"Venomous snakes abound in Zululand. Eau de Luce, ammonia and nitrate of silver should be provided. If these are not at hand, a bite is often neutralized by making the sufferer drunk with some spirit."

Extracts from Surgeon-General Woolfryes' report on the climate of the northern portion of Natal and Zululand :—

With regard to the climate and diseases which prevail on the sea coast at the Tugela mouth, Dr. Jones, District Surgeon, states that at a distance of 15 miles from the sea, fever is not more prevalent than in the interior, that the "high ground is comparatively safe everywhere in his district," and that the type of fever is mild, the attack lasting usually from five to 20 days. It begins about February, is at its worst in March, and continues more or less till the end of May, appearing to be influenced to some extent by the current of the N. E. wind, which would of course carry the miasma of the St. Lucia swamps in this direction.

Dysentery is not very common, but the occurrence of bloody urine in both men and animals is very frequent, and tapeworm exists to such an extent that "almost every second person you meet with has worms of some sort."

The water in this locality is slightly brackish, but not apparently injurious to health.

With respect to the climate and diseases of the Upper Tugela

between Umsinga and the river, Dr. Dalzell, District Surgeon, looks on fever as comparatively rare, never having seen any serious cases except those brought out from North Zululand.

"The high lands are remarkably healthy. It is likely that white men living in the deep valleys would take fever, but no white men live there." Dysentery and rheumatism appear to be more common in this locality, where also tapeworm exists "in abundance." Cases of sunstroke have occurred, and Dr. Dalzell speaks of the heat in the valleys during the summer months between the hours of 11 A.M. and 3 P.M. as "terrible." Also, "the Tugela (18 or 20 miles only from this) runs in a deep valley. Troops could not easily be kept healthy there owing to the intense heat, while horses would almost inevitably die in great numbers unless stabled."

"The water in this district is generally brackish."

The sanitary precautions of most importance to be attended to against these conditions are :—

1. That troops should never, unless compelled by some strategic necessity, be encamped in a valley, but should always occupy as high ground as practicable.

2. That tents should be pitched for the men to sleep in whenever possible.

3. That hot coffee, or cocoa, should never be omitted when men turn out at, or before, daybreak, and that men on guard should always be provided with this ration to be used as soon after 4 A.M. as it is possible to light a fire.

4. For the prevention of dysentery, it is most desirable that the wearing of cholera belts by the men should be stringently enforced.

5. With a view to the avoidance of tapeworm orders should be given that the internal organs of animals such as liver, kidneys, brain, &c., are not to be eaten, and that all meat is to be thoroughly cooked.

6. The preparation of tea and coffee to be carried in the men's water bottles should be encouraged as much as possible, so as to ensure the water being thus boiled before use.

7. Whenever possible, the water should be filtered, and in permanent camps rain water should be collected.

It would, therefore, appear that Zululand closely resembles Natal in its seasons, climate, and physical features, possessing the same healthful high lands and unwholesome valleys, with this addition, that while within a belt of 15 miles from the sea, and extending from the Tugela mouth to the Umlatoosi River the fever is but similar to the type of

Natal fever in a like locality, nevertheless within the same belt stretching from the Umlatoosi to St. Lucia Lake, the disease becomes as deadly and intractable as the worst malarious fevers of other countries. The same also holds good of the tract known as Oham's country, situated in the valley of the Black Umvolosi River. It is, therefore, evident that the fever of this country must always be intensified in every locality which is within reach of the poisonous malaria borne hither and thither on the wind, and while its exact travelling power is still an unknown quantity, an index of its intensity may be taken from the distance at which the Umlatoosi River lies, where report says it loses its greatest virulence. No exact circle can, however, be drawn round the centre of infection, since the prevailing winds and the indraught of valleys must always carry it farther in some directions than in others. Thus the valley lying at the foot of St. Paul's Mission Station, though only 10 miles long, is said to be especially unhealthy, and fatal to any oxen or horses that are benighted in its hollows.

Delagoa Bay.—The climate of Delagoa Bay has the reputation of being unhealthy for Europeans, and it doubtless is so up the rivers and in the vicinity of swamps,—but there is no reason to suppose that Port Melville is particularly unhealthy, as it is exposed to sea breezes and is at a considerable distance from any rivers. Inyack Island, on which Port Melville is situated, is said to be used by the natives as a sanatorium.

EXTRACTS from a report on the Natal and Zulu climate as affecting animals, by B. L. Glover, Veterinary Surgeon R.A. Pietermaritzburg, 23rd September 1878.

DISEASES.

In the event of an advance of troops on to the Zulu frontier, or a campaign in Zululand, four diseases may produce serious havoc among the animals,—viz., horse sickness and glanders, affecting horses and mules; lung sickness and redwater, affecting cattle.

Sickly season.—November to April for horse sickness and redwater. Lung sickness and glanders occur throughout the year, and are not affected by seasons.

Horse Sickness produces greatest mortality in Natal and the Transvaal. The districts which suffer most are believed to be Weenan, Ladysmith, and the country along the river Tugela, and next, the low lying land on the coast. At Utrecht and surrounding country it is also very fatal. The districts most free from the disease are said to be Weston, Greytown, and the country between the Biggarsberg and Newcastle. The greatest mortality occurs in the low lying districts, the "high veldt" being comparatively free from the very virulent forms.

The disease generally breaks out towards the end of November

or beginning of December, being hastened on and becoming more severe in wet weather. It is believed that the Lower Tugela is pretty safe up to January. It is probable the disease is as prevalent in the Luneberg District as at Utrecht, and it is said to be very fatal in Zululand, almost more so than in Natal.

Glanders is at all times more or less prevalent in Natal. The probability of serious outbreaks occurring in the proposed campaign will much depend on the hardships the animals have to encounter, low condition and poverty being favourable to the production of spontaneous glanders, which is infectious and contagious.

Lung Sickness is a highly infectious and contagious disease, producing great mortality, to be met with all over the colony. The disease is believed to be equally prevalent in the Zulu country, instances having occurred of whole spans succumbing to its virulency.

Red Water is a blood disease chiefly affecting the digestive organs. It is most rife and virulent at the beginning of the summer after the first week's rain, and is met with in most parts of Natal. The disease is prevalent between November and April, very wet summers being especially noted for its virulency. The road between Howick and Colenso is considered the most deadly district for it in the colony, and that between Maritzburg and Newcastle *vid* Greytown correspondingly free from it. The country along the Tugela River, and what is known as the "thorn country, also suffer considerably; but it is a general opinion that "up-country" cattle have a certain immunity from the disease in these districts till very late in the summer. It is also met with about Utrecht in Zululand, where it is said the mortality is not so great as in most parts of Natal.

The *healthy season* for animals is between April and November, "still, should another season of drought occur the losses in stock, even during the healthy months next year, will almost compete with the mortality of a bad sickly season."

The Reverend — Robertson writes: In the up-country district, notably in the neighbourhood of Isipezi Mountain, after the first rains of spring, a tulip grows—grass being scarce, cattle eat of this, and are sure to die. The remedy is homœopathic; the natives bruise up the plant and make a drink of it for the cattle. Strange as it may seem I believe it to be effective."

TSETSE FLY.

The tsetse fly (*Glossina Morsitans*) is met with more or less in various valleys in the low districts of Zululand, but probably owing to the large game having been driven northwards, the tsetse, which is supposed to go with it, has much disappeared of late. The supposed limit is shown on the map (*q v*).

Dr. G. Geoffrey Indian Medical Service, in writing to the *Indian Medical Gazette* states that he has found the following treatment most efficacious in removing the intense pain consequent on a sting from a scorpion, and he feels convinced that the hypodermic treatment with a similar or perhaps stronger mixture in a larger quantity would be found successful in the case of an animal being bitten by a tsetse fly.

The remedy for a scorpion bite consists of a hypodermic injection at the seat of the sting, or into the wound if visible, of six minims of the following mixture :

R. Liquor Ammon : fort. Liquor Morphia Hyd. Aquae . . à à z s.s.

Of the tsetse fly-bite he says.

1. One sting or puncture only is sufficient to cause death.
 2. The puncture is easily found.
 3. The poison takes a long time to enter into the circulation and cause death.
 4. Inside the wound and under the skin a patch of yellow mucous matter is always found, and the above remedy quickly applied would, it is considered, neutralise the local poison before it took a fatal hold of the animal.
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TRADE, AGRICULTURE, PRODUCTIONS WITH THEIR BEARING ON RESOURCES AND TRANSPORT, &c.,

CATTLE.

As in South Africa generally, the wealth of the people consists in cattle: Mr. Fynney says, "at present, owing to diseases which have sprung up of late years, and the fact that the King has parted with many thousands in the purchase of guns, the country is poor in stock compared with what it was. In olden times if cattle were required, a raid was made upon some weaker tribe, but now, thanks to the restraining influence of a strong government, Cetywayo dare not raid. They have a goat, which they breed for food, also Kafir sheep, something like the Cape sheep. Their stock of all kinds is much too few for their need. This arises from the command of the king for each man to arm himself with a gun, which has obliged them to sell cattle, and from the danger which every rich man incurs of being eaten up on some frivolous pretext of witchcraft."*

Sheep.—White sheep and black African sheep do well in the upland and coast districts, but in the low bush country white sheep will not live.

Produce.—Maize, millet, and tobacco are grown in small quantities. The gardens are prepared by the women in the vicinity of their kraals by means of the Kafir hoe, the men taking no part in their labours.

These crops are reaped in the low country about March and April the maize being ripe before the Kafir corn. Up country the harvest, is rather later.

The belt of rich alluvial soil stretching inland 10 to 15 miles and extending all along the coast would grow valuable crops of sugar and coffee. The climate, though not so healthy as in other parts, is not positively unhealthy, except for horses and cattle in summer.

On the first terrace, at about an elevation of 1,500 feet, sweet potatoes, sugar, coffee, bananas, and arrowroot all thrive.

The second and third terraces, at elevations of from 2,000 to 2,500 feet and 3,000 to 4,000 feet respectively, are suitable for stock breeding, the upper being peculiarly well-adapted for sheep.

Indian corn, millet, and sweet potatoes do well throughout Zululand. Almost all our English vegetables may be produced upon the uplands. Nearer the coast, the pine apple, banana, and arrowroot thrive where planted. The food to be obtained for barter goods consists of Indian corn, Kafir corn and millet, sweet potatoes, native earth beans,

* Rev. G. Blencowe.

milk, amasi (sour milk curds), and utwyala or native beer. The only grain grown by the Zulus is maize and Kafir corn (millet) of which they make their beer. But of these so small a quantity is grown that it is only in the best seasons that the stocks last till the new crop is ripe. They are therefore very often two or three months before harvest nearly starving. Any European force going into the country would need to take their supplies. The only food that the country could supply to an invading force would be *mealies*,* as on the threat of an invasion, the natives would immediately remove their cattle. As regards the spots where the mealies would most probably be found the Hon. W. Drummond remarks.—“In time of peace the Zulus keep their mealies underground in the cattle enclosures; in time of war it is difficult to say what they would do as they have not been before invaded. It is however more than likely they would form dépôts in the thorn bush country to the south of Ulundi.”

All the highlands are capable of bearing wheat, and it has been grown by the Norwegian missionaries as low down as Ondine.

Water.—Water is abundant throughout the country. When streams run dry, water can generally be obtained by digging in their beds. A Kafir kraal is a sure indication of the proximity of water.

Forage.—Forage is not grown in Zululand, but there is generally a supply of grass in summer and winter.

Grass.—There is reported to be a poisonous grass in many, if not all the valleys and bush lands coastwards, and in the early spring a plant of the tulip family is very destructive to oxen, coming up green and fresh before the young grass shoots after the dry season, it is eagerly devoured by cattle unless well herded. Another authority however says the borderland at all events is free from poisonous herbs, and he doubts their existence in the interior.

In the summer season there is plenty of grass along the roads from Natal. In the winter months the coast road alone affords good feeding, the supply near the centre road from the Lower Tugela drift being rather scanty.

Horses will eat Kafir corn (millet).

If horses are fed on Indian corn they should not be watered for two hours after, as the corn is otherwise liable to swell inside and kill them.

Fuel.—The fuel is wood, which is generally obtainable in sufficient quantity. The supply of wood is not equally distributed, so that with a larger population, some districts would have to obtain their supply from a distance.

* Indian Corn.

Horses.—The Kafirs keep a few horses but they are very poor. A Transvaal correspondent writing in August 1877, says there are now several hundred horses in the Zulu country, chiefly stolen property, and that the high mountainous ranges which intersect the country make it healthy for horses; very few die of disease unless allowed to run on the low land, where they are liable to what is called horse-sickness (a peculiar kind of inflammation of the lungs) which is fatal in nearly all cases. The bush veldt or hlangane is very poisonous, horses dying there by disease, fly and poisonous grass.

Zulu Ox.—The Zulu ox as a trek ox, is unequalled in South Africa, being enduring, hardy, and easily supported upon but little grass. He is capable of travelling long distances, and bears the vicissitudes of climate and changes of pasture and water very well. When fat his carcase yields about 400 lbs.

Game.—Wild beasts and game abound, but are not so plentiful as in former days. Leopards, panthers jackals, hyænas &c., and on the coast hippopotami are found, also buffalo, heartebheest, koodoo, spring-bock, quagga, gnu, &c. The numbers of the latter have been diminished by lung sickness in recent days, which has also attacked the cattle.

Trade.—Coal exports from the country are cattle, hides, horns, and ivory.

MINERALS.

Coal.—Coal has been obtained near the Thlanga 'Mvula Mountains, and it is likely it may be found in other places to the north-west of Rorke's Drift, as the new sandstone in which all the South African coal is found extends to that district and has many good seams of coal just over the river in Natal.

Iron.—The Iron of Zululand, like that of Natal, is not likely to be smelted till the almost boundless supplies of much richer ore in the Transvaal are exhausted.

Gold.—There are quartz reefs starting from a little below the junction of the Buffalo and the Tugela, in which minute portions of gold have been found, but not in paying quantities.

TRADE IN FIREARMS.

Consul Elton, in his commercial report on the Portuguese Possessions East Coast of Africa, calls attention to the fact that cheap guns, gunpowder, picks, blankets, and spirits, are introduced at Delagoa Bay. The result is that a dangerous post for the wholesale supply of guns and ammunition to natives is opened at Delagoa Bay, whence thousands of guns pass into the hands of the Zulus and other neighbouring tribes;

while the unregulated sale of spirits to the Amatonga is fast demoralizing the country.

Mr. Trollope states that *rifles* are bought by the Zulus at Delagoa Bay for 24s a piece.

A writer from Utrecht further says that some 1,000 breechloaders have been taken into the country from Delagoa Bay, and that the ammunition is supplied from Natal. The natives also manufacture a rough kind of powder.

Besides obtaining arms from Delagoa Bay the Zulus have also obtained them from several ports further north, viz., from—

1. Inhambane, in the Umzela country, on the Limpopo River inhabited by a tribe of Zulus. Here, recently, a merchant is reported to have sold in one day 1,800 stand of arms.

2. The port of Bazarout further north.

3. The port of Quilimane at the mouth of the Zambesi.

All these are in Portuguese territory.

Gunpowder.—A powder factory is reported to exist near Ulundi. All the ingredients, except charcoal, are imported from Natal.

TRANSPORT.

Deputy-Commissary Strickland, reporting on the question of transport in the Transvaal, says, "The subject of transport is of special importance in this country, where it has many enemies. The wagons must be proof against very bad roads, the animals against sickness caused by climate, by the tulip plant, and by the tsetse fly; each of these enemies has its own special period of the year,

"Mules as a rule are preferable to oxen, as they endure hunger and cold better in winter, when they must be fed, but in summer the veldt is well covered with rich nutritious grass.

"The mule as a transport animal is much inferior to an ox, and is subject in many localities to a deadly sickness brought on apparently by climate and causes localized within a circumscribed space, inexplicable of themselves and in no way understood.

"In a wet summer, when the roads become very impassable, mules and horses have not the power nor steadiness of oxen, and, being hard worked, become more than ever liable to sickness.

"There are places in the Swazi and Sekukuni's country where horse sickness is deadly during the summer, also on the eastern slope of the Drakensberg. For a summer campaign oxen would be indispensable.

"Mules, however, have certain advantages over oxen. They can travel 25 miles a day with ease, whilst 15 miles a day with oxen is good work; on the other hand, a mule costs twice as much as an ox, apart from the cost of feeding. The mule must be fed on forage carried by him or bought on the road. The ox will feed on the veldt, except during three winter months when matters are so managed in the Transvaal that he is but very little worked.

"Two kinds of mules are obtainable (Pretoria ?), the Monte Videan and the home-bred animal. The latter is generally preferred although the former is much more tractable. Great care should be exercised in purchasing oxen, none but those bred in the Sour Veldt of Natal and Zululand should be purchased for general purposes, for, as a rule, these will live better than the others anywhere.

"The Dutch or "Up-country" ox is very liable to bush sickness in Natal, the Zulu country and Sekukuni's country. The bastard Zulu ox, a pretty thick set, short-legged, solid animal, is considered altogether the best ox of the country. He never suffers in condition as the larger oxen do, and the latter have no advantage for draft. The so-called sour grass (Zuur veldt) is found over the great part of Zululand. Cattle which have been brought up on the sweet grass (zoet veldt), which is found on the northern side of the Draakensberg, die in large numbers if fed on the sour grass.

"The usual load here is about 7,000 lbs., placed on a wagon weighing 3,000 lbs., drawn by 16 or 18 oxen. The cost for oxen may be set down at about 9*l.* each, and each wagon with dissel boom and yokes, complete, cost say each 180*l.* The cost of mules will average 20*l.* each, and mule wagons 100*l.*; harness for each mule 5*l.*

"The wagons generally used are far too heavy, and I think much lighter ones might be adopted with great advantage.

"The roads here are as a rule better by far than those in America, yet American transport is far more rapid and perfect than here. The same remark applies to the roads of Australia and New Zealand.

INHABITANTS, CHARACTER, PURSUITS, AND LANGUAGES.

POPULATION.

IN his "Compendium of South African History and Geography," Theal estimates the population of the Zulu tribes at less than 150,000; other authorities fix it higher, some as high as 300,000. They are all Zulus, but there is the usual subordinate division into tribes. Of the Zulu people, Theal says, they are neither more bloodthirsty in disposition nor more powerful in frame than the other Kafir tribes of the Coast region.

Character.—One who has resided several years among them gives their general character as honest, bold, cheerful, good-tempered and cruel. Mr. Finney bears testimony to their truthfulness, honesty, and faithfulness, and says that as a people, the Zulus are powerful, well-built, and capable of great endurance. The mental capacity of the natives is said to be of a fine order, "the young blood of the country is rash, the older Kafirs are exceedingly shrewd, wise, deliberate, self-controlled." Dr. Mand (M.D.) of considerable Natal experience, bears testimony to this, "If you take the young Zulu Kafirs, you find them petulant, impetuous, wild, and unreasonable; but if you take the older Kafirs, they are shrewd, sagacious, and almost political; they have great ability, and even without education seem a much higher race intellectually than the lower class of the agricultural population in England."

The life led by most of the inhabitants is by no means easy, nor even healthy. The men are constantly obliged to attend the military kraals, while the women and girls are required to keep the men supplied with food, and are thus subjected to severe labour and long and tiresome journeys. The Zulu military system does not provide a commissariat. Every man has to be his own purveyor, and hence the severe toil imposed upon the women. The average height of the Zulu Kafirs is about two inches above that of Englishmen; if well fed they are capable of great endurance; they are cleanly in their habits. They are said to be warlike, indolent, tractable and trustworthy to a fault. Their religious belief is obscure; they believe in witchcraft, the transmigration of the soul, and worship the spirits of their ancestors; they are eminently superstitious.

For many years missionaries have been labouring among the Zulus, but they have not met with much success, the political condition of the country offers the greatest obstacle to the efforts they are making. The persons and property of the missionaries are however as safe as anywhere in the world, and they are treated with kindness and respect by the people generally.

The Zulu is naturally idle, scorning work, and spending his time in hunting, smoking, drinking beer, &c. The women do all the work. They cultivate the ground, aid in building kraals, bring wood, procure the food and in fact, attend to everything.

The natives are of the same race as those settled in Natal, but, with the exception of the Royal House and chiefs, inferior in physique.

Every Zulu is a soldier, and Colonel Bellairs reports them as brave and fond of fighting, full of confidence in themselves, and with an exaggerated idea of their own numbers and prowess.

The Zulus are excellent walkers, and would probably cover from 40 to 50 miles a day with ease, requiring only a handful of mealies and a little water as sustenance.

The food of the inhabitants is mealies, and their drink water. Occasionally the king orders cattle to be slaughtered, and beer brewed for his troops but this is the exception, not the rule.

It is no unusual thing to meet troops of girls carrying mealies and Kafir corn to their soldier relatives, and this often from distant parts of the country.

Capacity for Military Service.—There can be no doubt of the warlike character of the Zulu race. Their present Military organization would also show that they are capable of submitting to a severe discipline.

Political Feeling.—Persons well acquainted with the country are of opinion that although the Zulus would fight against the white men if called upon to do so by their chiefs, a large proportion would thankfully welcome English rule, which would put an end to the arbitrary despotism of Cetywayo, which is but a reign of terror.

Swazis.—This tribe is an offshoot of the Zulu. The Zulu kings have ever been jealous of the Swazis, whom they failed to subdue on account of their superior fighting qualities and the fastnesses in their country, which they cannot penetrate.

Captain Harvey believes they can turn out 10,000 fighting men.

Captain Carrington, 1-24th Regiment, states that a large number could easily be obtained as recruits, and that, led by Europeans, they would prove excellent auxiliaries.

Feuds exist between the Zulus and the Amaswazi, who inhabit a district to the north of the Zulu territory. This tribe is practically independent, but their country is within the limits of the Transvaal, as proclaimed by Pretorius, formerly President of the Republic. They are traditional enemies of the Zulus, and it is probable that in the event of active operations, their co-operation might be relied on. They submitted to the supremacy of the Transvaal Republic, and lent their aid to the suppression of rebellion within that State.

Internal Feuds.

Feuds exist within the country itself, between the king and several of his brothers and great chiefs. It is reported that there is at present (1878) a feud between the young and the old men, the former being eager for war, while the latter are unwilling to fight with the English.

Language.

The Zulu language alone is spoken in Zululand ; interpreters may easily be obtained in Natal.

HISTORY.

EARLY HISTORY.

THE official *précis* of information on the Colonies of Natal carries the history of the Zulu nation up to the Coronation of Cetywayo in 1872. by Mr. Shepstone. It must however be noted that at Esinebini, on the 5th October 1843, by a special treaty between Panda and H. M. Commissioner Henry C. Cloete, St. Lucia Bay and "such land connected therewith as might be agreed upon" was ceded to England.* The cession of this portion of Zulu territory is not recorded in the above work.

Accession of Cetywayo.

Since the accession of Cetywayo, the relations between the Zulu State and the Colony of Natal have not been unfriendly, but a boundary dispute between the Zulus and the Boers existed at the time of the annexation of the Transvaal by the British Government, which we have since been unable to settle, and which has been the primary cause of the present war.

Cetywayo has not retained the vast power of his predecessors, but he is the most powerful and influential chief in South Africa, and acknowledged as suzerain by many chiefs beyond his own dominions. Some accounts state that his dictatorship extends over all the chiefs and tribes south of the Limpopo, while others name even the Zambesi as the outside limit.

One of the most powerful of these tribes is ruled by Sekukuni, who is, there is little doubt, in secret alliance with Cetywayo.

Boundary Dispute.

The dispute is of long standing, and briefly stated, its history is as follows:—

In the early part of 1861, Umtonga and Umghilana, two sons of Panda, fled to Utrecht from their brother Cetywayo; the latter demanded their surrender, and in return offered to the Boers a tract of country to the east of the Blood River (boundary line marked A on the map.)

There appears to be no doubt that the fugitives were given up, and an agreement was entered into by Cetywayo with the Utrecht Commission in 1871, by which territory was ceded as far as the above mentioned boundary.†

* Parliamentary Papers on South Africa, February 1878.

† Sir T. Shepstone.

The Zulus, however, deny the agreement and the cession.

No action was taken by either party to the agreement until December 1864, when it is affirmed the Transvaal Executive Council and Zulu delegates erected beacons, marking the boundary, and ordered all Zulu subjects to retire beyond the boundary (A on map) by their king's order. The Zulus nevertheless persist in denying the agreement and the cession.

The dispute dragged on, and in 1870 Cetywayo strongly urged the Natal authorities to accept the strip of land claimed by the Boers. The Government refused, but consented to send a commission to examine the boundary line.

The Commission, which assembled in 1878, found, however, that the Zulu king now put forward a claim to a much larger amount of country than he had hitherto done (shown on the map as B, B, B.) A demand which it will be seen was impossible to accede to.

In the first place the greater portion of the land in question has been occupied by the Transvaal Republic without protest from the Zulus. Secondly, a part of it is occupied by a tribe (the Swazies) who have never been subdued by the Zulus. It would, therefore, have been impossible to have ceded the land in question. Moreover, Cetywayo brought no evidence before the Commission to support his claim. But he proved satisfactorily that the country included within the boundary line marked C, C, C, belonged to Zululand, and accordingly the Commissioners in their award gave it to him. At the same time they stated that, as we have seen above, his claim to the country north of the Pongolo could not be substantiated.

The British High Commissioner confirmed the proceedings of the Commission, and had the award made known to Cetywayo. The king, however, does not appear to have been satisfied. The hostile attitude which he assumed, and the raids made, if not by his authority, at least with his connivance, on British territory, rendered it therefore necessary to take steps to assert our supremacy and to protect the inhabitants of our own lands from injury.

The consequence of this was the ultimatum despatched to Cetywayo in December, and on his neglecting to comply with the terms stated therein, the subsequent invasion of his country.

INTERNAL ADMINISTRATION

MR. F. B. FYNNEY, who has spent 27 years among the Zulus, states that Cetywayo, the king, is altogether an irresponsible despot; his word is law, and the least disobedience or supposed disregard of that word in most cases costs the offender his life. He is very superstitious, and has made it a crime punishable with death for any Zulu to become a Christian. He holds that a Zulu converted is a Zulu spoilt, and that each mission station is a centre of disaffection in the land.

The authority of Cetywayo is based so entirely on terror, that if at any time he should come into collision with the power of England and meet with a signal reverse, he would in all probability be swept away by the prompt insurrection of his own people.

The laws of the nation are based upon the principle of tribal responsibility. The system is strictly feudal, and the king is a military despot, in whom is now solely vested the power of life and death, until recently exercised by the principal chiefs.

The king is assisted by a prime minister and a council composed of the great men of the nation.

The people are divided into clans, each under its own chief, responsible to the king alone.

Theal says, "although the country is capable of supporting a large population, one may in some parts travel for miles without seeing a kraal or other sign of human life. This state of things is attributable to the political condition of the country. The Government is about the most despotic that can be conceived. Until very recently, cases of violent death were of frequent occurrence, and, generally speaking, when a man was put to death, one or two of his wives suffered with him."

*King and the Indunas.**—The king, an old resident says, has always about him in his own kraals, and the neighbouring military kraals, hundreds of Indunas and other great men, who fatten and grow rich by a system of plunder. These again have each their own following of young men ready to do their bidding. There must at all times be about 3,000 or 4,000 of these young men at the kraals.

Military Enrolment.—All the males are under the obligation of a military service, and a writer to the *Natal Mercury* states that unmarried women are also enrolled into feminine contingents.

Marriage.—No man is allowed to marry without the king's permission; hence a large part of the population live in compulsory

* An Induna is a person in administrative authority.

celibacy. He never allows his warriors to marry till they are well advanced in years, and then whole regiments are married off at once. The men of the regiment which obtained this permission in the early part of last year averaged 40 years of age.

It is customary on any special occasion for the king to decree that a whole regiment shall marry ; and, further, that they shall take in marriage the daughters of those composing a named married regiment.

MONEY, WEIGHTS AND MEASURES.

MONEY BARTER.

THE Zulus do not understand money. Cattle, best railway rugs (for the chiefs), coloured blankets, cotton blankets, cotton sheets, coloured handkerchiefs, butchers' knives, beads of all kinds, brass pen boxes, wire, lead, and Kafir picks are the articles most in demand. Guns and ammunition are eagerly asked for, but they are contraband for barter with natives.

ARMY.*

ARMY.

Strength of Zulu Army.—The Zulu army has been usually estimated at a figure between 30,000 and 40,000 men. A missionary, however, well acquainted with the country, the Rev.—Robertson, considers that this is an under-estimate; he has seen 37,000 present at the great annual feast, about two-thirds of the whole, which would raise the entire force to 60,000 men. It has also been stated† that there are some corps of unmarried women, but there appears to be no reliable information as to this point.

It is not distinctly known at present how the Zulu forces are armed, but report says that they are well provided with breech-loaders, although deficient in ammunition.

Method of Recruiting.—The method of recruiting the army is as follows; At short intervals, varying from two to five years, all the young men who during that time have attained the age of 14 or 15 years, are formed into a regiment, which, after a year's probation, during which time they are supposed to pass from boyhood to manhood, is placed in a military kraal or headquarters. This kraal may either belong to another regiment with which the young one is incorporated, or it may be newly formed.

As a rule several regiments of different ages are combined at the same kraal so that the young soldiers may have the benefit of the experience of their seniors, and on the latter dying out, may take their place and maintain the name and prestige of the military kraal.

In this manner corps are formed, occasionally (as with the Ondi or Undi) some thousands strong.

Formation of Army.—The Zulu army now consists of 12 such corps and 2 regiments, each with its own military kraal.

These corps necessarily contain men of all ages, some being married others unmarried, some being old men scarcely able to walk and others boys. At the present time there are five of these corps, each of which consists of a single regiment, while the remaining corps are composed of several regiments.

* The following account of the Zulu army is principally extracted from a Memo published by the direction of Lieut.-General Lord Chelmsford, for the information of those under his command, Nov. 1878.

† "Natal Mercury," Jan. 26th, 1878.

Internal Formation.—These twelve corps and two regiments have the same internal formation, which may be described as follows:—

The regiment is divided into two wings, the right and the left and is again subdivided into companies, which vary in number according to the strength of the corps.

As a rule these companies may be taken at an average strength of 50 men a piece, with the exception of the Nkobomakosi regiment, which averages 70 men per company.

Officers.—Each corps or regiment, possessing its own military kraal, has the following officers:—

One commanding officer ; one second in command, who directly commands the left wing, and two wing officers. There are likewise company officers, consisting of a captain and from one to three junior officers, all of whom are of the same age as the men they command.

Uniform.—The uniform of the Zulu army is clearly laid down and is somewhat different, as a rule, in each corps. The great distinction is between the married and unmarried regiments, the former are obliged to shave the crown of the head and to put a ring of leather round it ; they also carry white shields, whereas the unmarried regiments wear their hair naturally and have coloured shields.

Statistics.—The total number of regiments in the Zulu army is 33, of whom 18 are married and 15 unmarried. Seven of the former are composed of men over 60 years of age, so that for practical purposes there are only 26 Zulu regiments fit to take the field, whose numbers have been estimated by Lord Chelmsford at 40,400, of these 22,500 are between 20 and 30 years of age, 10,000 between 30 and 40, 3,400 between 40 and 50, 4,500 between 50 and 60.

Drill.—In the ordinary acceptation of the word, drill is unknown in the Zulu army. They, however, perform a few simple movements with some method, such as forming a circle of companies or regiments breaking into companies or regiments from the circle, forming a line of march in order of companies, or in close order of regiments. The officers, however, have their duties and responsibilities according to their rank, and discipline is most rigidly enforced. Commodore Sullivan, writing in August 1878, gives a high account of the discipline of the Zulu army. He states that the regiments are so well disciplined that the men never fall out of the ranks on the march under any pretext ; they march at the double, and are said to keep up from 50 to 60 miles daily, carrying their own provisions.

Commissariat.—The Zulu army requires but little commissariat or transport. Three or four days' provisions, in the shape of maize or millet, and a herd of cattle proportionate to the distance to be traversed

accompanies each regiment. The provisions and camp equipage, consisting of sleeping mats and blankets, are carried by lads who follow each regiment, and also assist in driving the cattle.

Mode of crossing a river.—The Zulu method of crossing a river is remarkable. When they come to a stream in flood, which is out of their depth and does not exceed from 10 to 15 yards in breadth, they plunge into it in a dense mass, holding on to one another, those behind forcing the others forward, and thus they succeed in crossing with a loss of only a few of their number.

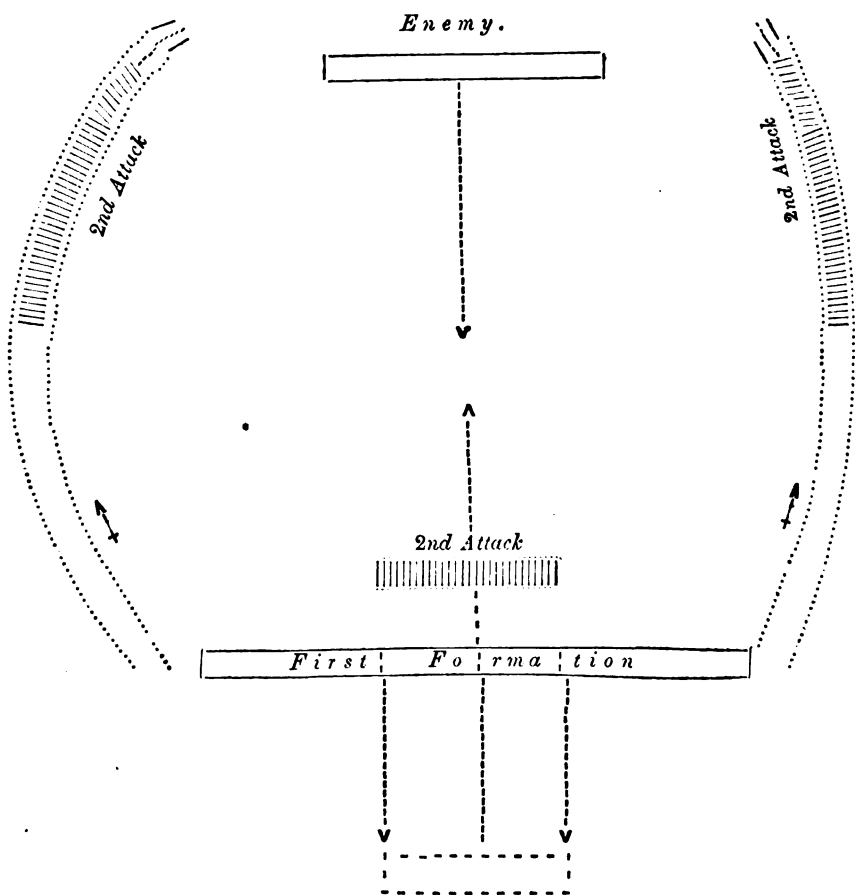
Preparations for war.—When hostilities are decided on against any other power, messengers are sent out by the king, travelling night and day, if necessary, to order the men to assemble in regiments at their respective kraals, where their commanding officers are ready to receive them.

Order of March.—When corps or regiments are assembled at their head-quarters they are usually ordered to proceed to the king's kraal. Before marching, a circle or "umkumbi" is formed inside the kraal, each company together, their officers in an inner ring, the first and second in command at the centre. The regiment then proceeds to break into companies, beginning from the left-hand side, each company forming a circle, and marching off, followed by boys carrying provisions, mats, &c., The company officers march immediately in rear of their men, the second in command in rear of the left wing, and the commanding officer in rear of the right.

On arriving at the king's kraal various superstitious ceremonies take place, and various medicines are administered to the warriors. On the third day, after their assembly at the king's kraal they are sprinkled with medicine by the doctors, and after some other formalities they start on their expedition.

Order of March.—Previous to marching off, the regiments re-form companies under their respective officers, and the corps selected by the king to take the lead advances. The march is in the order of companies for the first day, after which it is continued in the "umsila" or path, which may be explained by likening it to one of our divisions advancing in line of brigade columns, each brigade in mass; each regiment in close column; the line of provision-bearers is more on the flank; the intervals between the heads of columns vary, according to circumstances, from several miles to within sight of each other, constant communication being kept up by runners.

The march is then continued in this order, but the baggage and provision-bearers fall in rear of the column on the second day, and the cattle composing the commissariat are driven between them and the rearmost regiment until the force approaches the enemy. When the latter appear in sight the whole army forms an "umkumbi" or circle



Zulu fighting formation.

for the purpose of enabling the Commander-in-Chief to address the men and to give his final orders for attack.

Method of attack.—The following account of the Zulu fighting formation is derived from a recent despatch of Lieut-Colonel Degacher, commanding 2nd Battalion 24th Foot. The information, he states, is obtained from a Mr. McNeil, who, in his youth, fought against the Zulus, and also from a "field-cornet," who had heard his father describe the attack :—

"It appears that the Zulus advance in a long thick line, which breaks up on approaching the enemy in apparent confusion. The centre pretends to retire to induce the enemy to follow, whilst the flanks move off rapidly to the right and left, and, circling round when out of sight, they form the claws which grip the enemy, whilst the centre, re-advancing, attacks in front, forming the body, as may be seen from the accompanying sketch.

A large body of troops as a reserve are also always kept in hand; they are usually seated with their backs to the enemy; the commanders and staff retire to some eminence, and retain one or two of the older regiments as extra reserves. All orders are delivered by runners.

It must be noted that the above account of the Zulu Army is derived from information which is not of very recent date, and it is probable that great changes have been lately introduced into their tactics, movements, and dress, consequent on the introduction of firearms.

They are reported to make great use of spies, to have an elaborate system for obtaining intelligence, and to be efficient at outpost duty.

From all accounts the native weapon, the assegai, in which formerly they were especially efficient, has not been entirely discarded since, in addition to firearms, four or five are usually carried by each man. One short and heavy bladed one is used solely for stabbing and is never parted with; the others are lighter and are sometimes thrown. The men armed with firearms do not carry a shield.

The following table of the Zulu Army is abridged from the memorandum published by the direction of Lord Chelmsford before referred to. The Zulus have no cavalry and possess but few horses :—

Note.—All regiments marked * are married men wearing the head ring.

Corps or Regiment having a Military kraal	Regiment composing Corps.	English meaning of name.	Name and position of Military Kraal forming Head-Quarters of Corps or Regiment.	Age of Men.	No. of Men in Regiment.	No. of Men in Corps.	Remarks.
*Usixepi ...	...	...	Usixepi, about 6 miles N. N. E. of the Emtoujaneni.	80	...	2,000	Note.—All the old regiments wear much the same war dress. The principal men wear a short kilt of civet and green monkey skin, tied round the waist and descending halfway to the knee. All the old regiments of Tyaka, and those of Dingaan, are mere skeletons; their names, however, being retained, and their numbers augmented by fresh levies. Thus the Usixepi consists of the Nokenke Regiment, the original levy having all but died out.
*Mbelebele..	Nokenke ..	The "Dividers"...	Ditto	30	2,000		
	...	The "Ditigious" ...	Mbelebelini on the E. bank of the black Umfolosi, about 20 miles N. N. E. of the Ondine.	78	...		
	Umhlanga ...	The "Reeds" ...	Ditto ...	28	1,000	1,000	
*Umlambongwenya	...	"Alligator River"	Umlambongwenya, close to the Ondine.	75	...	2,000	
	Umxapu ..	The "Sprinklers"	Ditto ...	35	2,000		
*Udukuza ...		The "Wanderers"	Udukuza, between the Emtoujaneni and the Usixepi	73	...		
	Iqwa ...	"Frost" ...	Udukuza ...	35	500	500	

*Balawayo	...	...	"Place of killing."	Kwa Bulawayo, about 4 miles W.N.W. of the Ondine.	70	...	1,000	Note.—Kwa Bulawayo was the principal place of execution used by Tyaka.
	Nengangeneni..		Name of a hill in Zululand, above the junction of the Blood and Buffalo Rivers.	Ditto	35	1,000		
*Udhlambedhlu	...	...	"Ill-tempered" ...	Udhlambedhlueni, about 6 miles E. of the Usixepi.	68	...		Note.—The Udhlambedhlu were Dingaan's chief regiment.
	*Ngwekwe ...		A crooked stick...	Ditto	55	1,000	1,500	
	*Ngulubi or Mhlenivu.		The "Pigs" ...	Ditto	53	500		
*Inkulutyane	...	...	Straight lines ...	Nodwengu close to Ondine	64	...		
	*Umsikaba ...		Name of river in the north of Swaziland.	Ditto	54	500	2,500	
	Udududu ...		...	Ditto	35	1,500		
	Mbube ...		Lion ...	Ditto	35	500		
*Udabakaambi	...	...	The affair of Ombi	Udabakaambi on the Spur, S. of the Ishalo Hill, about 8 miles N.E. of the Ondine.	60	400	1,000	Note.—There are not included in the estimate of number any men over the age of 60. Thus the first of the old regiments whose numbers are given is the Udabakaambi.
	Umkusi ...		Name of a river in Zululand.	Ditto.	55	600		

Corps or Regiment having a Military Kraal.	Regiment composing Corps.	English meaning of name.	Name and position of Military Kraal forming Head-Quarters of Corps or Regiment.	Age of Men.	No of Men in Regiment.	No. of Men in Corps.	Remarks.
*Leangu	...	Vaal river	Isanqweni close to Ondine	54	1,500	...	NOTE.—The Undi is not the name of an original regiment after which the military Kraal has been named, as all the above are, but the designation given by Ketchwayo to the corps which includes the royal regiment—the Tswana—as well as four others.
Undi	...	Drakensberg	...	...	...	...
	*Tswana	Name of a Basuto chief, Usikwate's father.	Ondine	45	1,500	...	
	*Akonkone	Blue gnu	Ditto	43	500	...	
	Ndhlondhlo	Euphorbia	Ditto	43	900	...	
	Indluyengwe	Leopard's den	Ditto	28	1,000	...	NOTE.—The Nkobamakosi regiment belongs to the Undi Corps, but does not use the same military Kraal as the rest.
	Nkobamakosi	The bender of rings	Old Ondine on the right bank of the Umhlatusi about 7 miles S. of main road.	24	6,000	...	
*Udhloko	...	Name of snake	Likazi, N. of and close to Ondine.	40	2,500	...	
Umbonambi or Nkonyanebomvu	...	The "Evil-seers" or "Red calf."	Umbonambi, on the coast, about 15 miles S. of the entrance to St. Lucia Bay.	32	1,500	...	
	Amashutu	The "Loiterers."	Ditto	32	500	2,000	

Umcityu	The sharp-pointed	Umkandampanvu on the left bank of the White Umfolesi, about 4 miles N. N. W. of Ondine.	28	2,500	} 9,000	NOTE.—This corps is known as the Umcityu or Ukandampanvu (Redhead) indifferently. The Umcityu is taken from a stick sharpened at both ends, because during the quarrel between Ketchwayo and his brother Umbulawwi, some of them took one side, and some the other.
Ungakamatye	...	"Stone-catchers"	Ditto	30	5,000		
Umtulisazwi	...	"Quieteners of the Land."	Ditto	29	1,500		
Usindanhlovu	The "Weight of the Elephant."	Usindanhlovu, in the bush country, about 12 miles S. S. E. of Ondine. Lately called Maizekanye.	
	*Umzinyati...	Buffalo River	Ditto ..	43	500	} 4,000	NOTE.—The boy regiments now forming are not put down, as they are not regularly enrolled and have no Military kraal.
	Uve ...	Name of a bird	Ditto ...	23	3,500		
			Total	...		40,400	

BOOKS OF REFERENCE.

THERE are but few trustworthy books published upon the Zulu country. The following have been used to some extent in compiling this work—viz:—

“Dictionary of the Zulu Language.” By Døhne. (There is also a good one by Bishop Colenso.)

“Narrative of a Journey to the Zulu Country in South Africa.” By Captain Allen F. Gardner. London. Crofts, 1836. 1 Vol. 8vo.

“Life with the Zulus of Natal.” By G. H. Mason. London. Longmans, 1855.

“The Transvaal of To-day.” By Aylward. London. Blackwood, 1878.

Much assistance has been obtained from notes kindly furnished by Bishop Wilkinson, late bishop of Zululand, and the Rev. G. Blencowe, late missionary in the same country; also from reports furnished by Commodore Sullivan, C. B., C.M.G., Colonel Bellairs, D.Q.M.G., Colonel Durnford, R.E., Captain Harvey, D.A.A.G., Surgeon-General Woolfryes, P.M.O., Natal, and Veterinary-Surgeon B. L. Glover, R.A.

The best maps of the country are:—

1. That published by the Intelligence Branch, Quarter-Master-General's Department.

2. Meronsky's, 1875.

3. Jepps' new map, 1878, which is a compilation of his older one and of Merensky's.

4. Petermann's, which shows the different Mission Stations.

TACTICS AND STRATEGY.

NOTES ON THE ZULU METHOD OF FIGHTING.

Although the Zulus will often meet their enemy in a fair fight in the open, like all savages, they are fond of ambuscades and other ruses.

In going through bush, remember that the Natives will often lie down to let you pass, and then rise and fire on you.
Colonel Gawler.

In moving through bush, advance and rear guards and flanking parties are necessary.

They should look well *under* the bushes and notice all footmarks and sounds, such as the cracking of bushes, &c., and note whether the twigs have been lately bent or broken, or the grass trodden down, all indications of men having recently passed. When the bush is too thick for flanking parties the leading file should turn to the right and enter the bush as far as he can, kneel, and look well under the bushes; the next file, after about five paces, turn to his left, and the next to his right, and so on. The whole body may do this or only the advanced guard, according to circumstances. As the rear of the force in question approaches, the files rise in succession and close by sections, moving along between the halted sentries, and when the foremost of these is reached the process is repeated,

When waylaying or surprising an enemy make no noise until the enemy finds you out, and move, not along the path, but just inside the bush. If the path be along the side of a hill choose the lower side for your party; 1st, because an upshot is best, especially at night; 2nd, because if you are on the upperside, the enemy has an easy retreat down the hill open to him.

When moving near an enemy, or reconnoitring do not return to the camp by the route you left it.

A common ruse with the Natives is to hide a large force in the bush and then show a few solitary individuals to invite an attack. When the troops enter the bush in pursuit of the latter the hidden men rise and attack them.
Colonel Crofton (late 6th and 10th Foot).

In advancing through bush a herd of cattle is seen feeding with only a small guard, which runs as soon as our troops appear. The mounted men push on to capture the former, and when they are well separated from the rest the Natives, who were hidden all the time in the
Captain Moynieux 22nd Regiment (lately returned from the Cape).

bush, rise and cut them off before the Infantry can come to their rescue.

Native advanced guards and flanking parties cannot be trusted, the former will cluster together and the latter will often lie down.

Natives always know when an enemy is in the bush, but they often forget to report it, thinking the white man knows as well as themselves.

The Zulus' method of attack is as follows :—

They advance in a thick line, and when pretty close to their enemy they pretend to retreat, the central third going straight to the rear, the two outer thirds retiring towards the flanks. When they have drawn him on, they return, the outer portions attacking the flanks and rear, the central one his front.

The remedy plainly is to echelon the flanks of the attacking force somewhat to the rear, thus turning the tables on him.

The Boers found that the Zulus could not stand repeated Cavalry charges on the flanks, and that a very effective method of attack was to gallop upon their flanks dismount, and fire into them ; retreating to re-load, or when attacked.

When the wagons of a force are parked at night, if the Zulus attack they always try to make the cattle, who are kept within the park, stampede, in order to break a hole in the line of defence.

The same applies to Cavalry, who should take every precaution against their horses being stampeded by a sudden attack.

(EXTRACTS FROM COL. PEARSON'S REPORT MAY, 1878.)

ROADS LEADING INTO ZULULAND.

OF the several roads leading into Zululand across the Buffalo and Tugela rivers, the two reported on in Reports A and B (*vide* pp. 13-17 and *post.*) are believed to be the most convenient for military purposes.

Both roads lead to Ulundi, Cetywayo's principal kraal, both, especially the one from Utrecht, are very fair roads, traverse a fairly open country, and both have a base of supply.

One or both roads can of course be used according to circumstances.

Utrecht Road.—Report A :—Supply Dépôt, Newcastle. Distance from Ulundi to Newcastle about 170 miles, Blood River to Ulundi about 120 miles.

A force operating by this road would give confidence to the Amaswazis, who could attack Oham's people under evidently very ad-

vantageous conditions, or make common cause with them if they prove to be disloyal.

Lower Tugela Road.—Report B:—Supply Dépôt, Durban. Distance to Ulundi about 155 miles, from Durban to the Tugela 65 miles, thence to Ulundi 95 miles. This road would be used for a column operating from Natal.

Guides.—Any number of efficient and reliable guides, white men who are thoroughly acquainted with every part of Zululand, can be obtained both in Natal and Transvaal, also reliable natives to lead native contingents.

Strength and Composition of invading Troops.—In estimating the strength and composition of the invading troops, it may be taken as a fact that—

- (1.) The strength of the Zulu army is generally believed to be about 40,000.
- (2.) That it is better armed, better disciplined, and the Zulus acknowledged to be more warlike than any other race in South Africa.
- (3.) Parts of the country, even in winter (the healthy season,) are very unhealthy for horses.
- (4.) Portions of the road reported on require levelling and repair; there are rivers to cross, and although they are nearly dry in winter, some light bridging apparatus would be required.

DEFENCES (COLONEL DURNFORD.)

“The dense thorns of the valleys of the Umlatoosi and Umvolosi Rivers form the first and second lines of defence of Zululand against attack from the British. In 1862, when the Zulus feared invasion from Natal, Cetywayo, then Prince Regent of the country, advised by his chiefs, decided to take up his position in the wide and thorny valley of the Umlatoosi, considering that the broken nature of the ground and the impervious character of its thorns, and its general unhealthiness to Europeans, would place him in a position of advantage against European troops. Had he been driven from this position, he would have retired across the White Umvolosi into a very thorny, broken, and unhealthy country, where he would have been perfectly safe, the position being so extensive that he could only have been driven out by sickness—this part of the country being deadly even to natives in summer,—or by famine, as it would have been practically impossible to prevent supplies reaching him.”

“The Zulu traditions are purely offensive, but it is believed that now they have elaborated a system of defence.”

GENERAL REMARKS.

"There are two open and commanding positions on the highlands to the south of the White Umvolosi and Umlatoosi rivers. The Emtongjaneni Hills (Magaibonium on Map), near the White Umvolosi, and the Ekowe or Tyos and Entumeni Heights, in rear of the Umlatoosi—healthy positions, well watered, and with abundant grass and wood.

"From the Emtongjaneni Hills (about 200 feet high) the circle of royal kraals on the farther side of the White Umvolosi, girdling the new capital Ulundi, here placed by Cetuyayo, according to custom on becoming king, can be seen three roads leading to the rear into the colony—the upper, central, and lower.

"The Ekowe, Entumeni, and Ungoya ranges, from 1,500 to 2,000 feet above the sea level, dominate the valley of the Umlatoosi. Healthy positions may be found on these heights, well wooded, watered, with excellent grass and two roads leading to the rear into the colony, the central and coast lines, which are joined by a cross-road, following the course of the Umlatoosi.

Both this and the Emtongjaneni Hills form good positions, should it become necessary to take possession of the country up to either of the named rivers, and the communications with the colony are fairly good also, and might no doubt be much improved.

"With the exception of the valley of the Umlatoosi, which would undoubtedly be held in force by the Zulus, and a few miles of country (broken and difficult) between the Inyazane River and Ekowe, there is no country that should much impede the march of all arms of Her Majesty's forces."

Colonel Ballairs writes: "Colonel Darnford, R. E., states that the simplest way of chastising the Zulus would be by entering the country at the beginning of the dry season (March or April), when the crops are well up and it is too late to sow again, yet before they are dry enough to burn, so that the Zulus might not, in that way, deprive an invading force of grass and corn."

"During that season the climate is tolerably healthy both for men and animals, while during the summer months horses, and probably mules, will not live in most parts of the country."

Surgeon-General Woolfryes, however, reports (*vide* p. 22) that fevers are prevalent from February to May.

As the approaches from Delagoa Bay into Zululand appear to be good (*vide* Section C), it might be advisable, with the permission of the Portuguese Government, to land a force there to attack Zululand in rear. The climate however, through which this force would have to

advance is unhealthy, it being in the fever and tsetse fly district, and for three months in winter only can the climate be considered fair. By pushing rapidly through this unhealthy district, a force invading the country from the north would probably prove of great service and help materially to bring a war to a speedy termination.

NOTES TAKEN FROM REPORT A. AND THE HON. W. DRUMMOND'S

MEMORANDUM.

Utrecht Road.—The key of the road from Utrecht to Ulundi is the Inhlazatye Mountain.

The road here runs along a narrow ledge with a precipice on one side, and on the other huge boulders interspersed with bush.

This road is the only direct line of advance on Ulundi. Should it be desired to reach the top of the mountain there is only one bridle path on the south side. "If this position is not held [by us?] the troops would have to make a round, passing through the thick bush of either the valleys of the Black or White Umvolosi. This position is about 12 hours' ride for mounted men from Utrecht."*

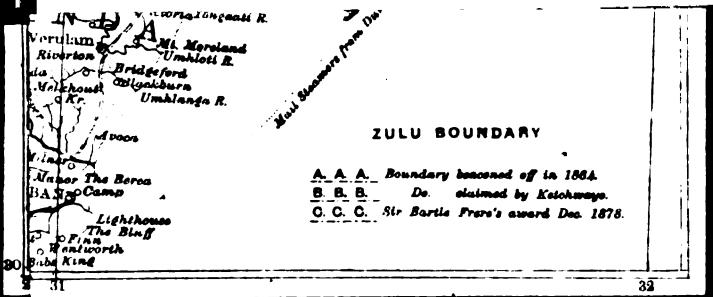
"The Inhlazatye Mountain covers a vast extent of country, has much thorn bush over it, is very broken and steep, but *can be turned* by an invading force from the north, either to the east or west, but preferably the latter, without passing through any bush worth mentioning."†

It would appear then from Mr. Drummond's Memo., that this mountain can be turned without necessarily passing through thick bush.

Ishilalo Mountain.—The "Ishilalo" or "Seat" mountain, commands the Utrecht-Ulundi road on its south and west sides.

* Lieut. Davis.

† Mr. Drummond.



INTELLIGENCE BRANCH, Q.R. MR. GENERALS DEPARTMENT 1878.



UNITED SERVICE INSTITUTION OF INDIA.

NOTICE is here given that the subject of the Essay for the Institution Gold Medal, for this year, is "A Transport Service for Asiatic Warfare."

The terms of competition are :—

1. The Candidates must be Government Gazetted Officers.
2. The Essays must be legibly written, or printed, not exceeding 32 Pages of the Size and Style of the Journal.
3. The Essays must be forwarded to the Secretary on or before the 1st May 1880.
4. The Essays must be strictly anonymous, but each to have a motto, and be accompanied by a sealed envelope with the motto written on the outside and the name of the Candidate inside.
5. The Essays will be submitted for decision to three Referees chosen by the Council.
6. The successful Candidate will be presented with the medal at the Annual Meeting (if he be present), and his Essay will be printed in the Journal.

By order of Council,

A. D. ANDERSON, CAPT. R. A.,

Secretary, United Service Institution of India.

UNITED SERVICE INSTITUTION OF INDIA.

The Council give notice that Life members to the Institution will be admitted on the following terms:—

“ Old Members ” Rs. 45 + Current year's Subscription = Rs. 50

“ New Members ” Rs. 50 + Entrance Donation = Rs. 55

Every Gazetted Government Officer is entitled to become a Member, or Life Member, on payment of the regulated sums.

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As Journals are returned from the Dead Letter Office with effaced addresses, Members who do not receive the numbers in succession are invited to intimate the same to the Secretary.

By order of Council,

A. D. ANDERSON, CAPT., R.A.,

Secretary, United Service Institution of India.

SIMLA. }
1st July 1879. }

NOTICE

MEMBERS of the Institution who have not already done so, are earnestly requested to pay their arrears of donation and subscription.

Officers who may wish to become members are requested to be kind enough to forward their donations and subscriptions at the same time as they express a wish to join the Institution.

Members can pay their subscription to the Alliance Bank Simla, if more convenient, and the Bank will grant receipts for any money sent.

The entrance fee is 5 rupees and the annual subscription 5 rupees.

Secretaries of Non-Commissioned Officer's Messes, and of Regimental Libraries and Reading Rooms can obtain the journal of the Institution by paying in advance the amount of the annual subscription only.

Members on changing their addresses are particularly requested to notify the change to the Secretary, in order that delay in forwarding the Journals may be avoided as much as possible.

The address book is corrected up to date from the Army Lists, but mistakes are occasionally unavoidable, unless members themselves promptly notify their change of residence.

Members proceeding to England on leave, who wish the Journal to be forwarded to them while absent from India, should inform the Secretary, and send stamps for the postage by Brindisi or Southampton.

When a member appears in orders for leave to England, his Journal is not despatched unless he asks for it, and while absent from India his subscription is not payable unless the Journal is supplied.

Members on return from furlough can obtain the numbers of the Journal that have been published during their absence, by paying the subscription for that period, and all members on returning to India should inform the Secretary of the fact.

The Secretary will be happy to send an Index to volumes I, II, III, IV, V, VI and VII to any member wishing for the same.

A. D. ANDERSON, CAPT., R.A.,
Secretary.

ORIGINAL PAPERS.

I.

THE KAFFIR WAR OF 1877-1878,

BY MAJOR M. GOSSETT, A. D. C., 54TH REGIMENT.

Continued from No. 37.

PART III.

THE WAR IN THE CIS-KEI UNDER THE COMMAND OF LIEUT. GENERAL THESIGER.

When General Thesiger assumed command at King William's Town, he found the general impression was that the rebellion had passed the critical stage; and that from their losses in the field and want of supplies but little further resistance was to be expected from the Kafirs.

Commandant General Griffiths had under his command a considerable Colonial force and was carrying out a combined movement against Sandilli in the broken and rugged country at the junction of the Thomas and Kei rivers

All was quiet in the Transkei although it was said that the Gcalekas had only retired across the Bashee to recruit before commencing fresh operations. Colonel Palmer was operating in the Kroome mountains, against Tini Macomo, a son of the Chief Macomo so well known in former wars. He had established himself in the Water Kloof Valley with a considerable number of rebels and had commenced to plunder the neighbouring farmers and Fingoes. In the war of 1850 Macomo had held the fastnesses in the Kroome Mountains for 21 months, despite all attempts to dislodge him. Lofty and precipitous mountains and deep valleys, with their sides seamed with Kloofs, clothed with large forest trees and tangled undergrowth of bush, extending over many miles of country, formed as difficult a theatre for military operations as could be imagined.

Fortunately Tini Macomo had little of the influence or determination of his father and although he eluded capture for some months the opposition he offered was feeble, and at no time caused any great apprehension.

The force under Colonel Palmer's command consisted of 300 men of the 90th and 1-24th Regiments and 2 guns. With a small force of Fingoes under Captain Bowker.

On the 9th March the "Himalaya" arrived with the 2-24th Regiment under Lt. Colonel Degacher. This Battalion was at once moved to King William's Town and prepared for the Field.

Turning to Griffiths's operations on the Thomas River. On the 10th march he reported that he had attacked the enemy two days previously, but met with no resistance, the enemy flying in all directions leaving 1200 head of Cattle in his hands. But in reporting this Griffiths was ignorant that Sandilli and the bulk of his force had escaped from the net he had drawn round him and were moving to the Buffalo mountains. In order to increase Griffiths's force, the various posts lying on the line Cathcart, Greytown, Stutterheim had been denuded of their garrisons, thus leaving nothing between him and the Amatolas should Sandilli manage to get away from the Thomas river. Curiously enough this loophole for escape was left on the 8th March, by a portion of Griffiths's forces taking the wrong road, and leaving the way open to the Amatolas. Sandilli hastened to take advantage of it and on the morning of the 9th the inhabitants of Stutterheim were thrown into a great state of consternation by the appearance of large bodies of Kafirs on the Kologha range within a few miles of the Town.

The only men left to guard Stutterheim were 20 mounted Volunteers and a few German police under the Magistrate Mr. Fleischer. This small force sallied out towards the enemy but soon had to retire before the large numbers opposed to them. The Kafirs could hardly have known the defenceless state of the place or else they were deceived by the bold attitude of the small garrison, for there was little to prevent their attacking and burning it.

Fortunately for the inhabitants they passed on to the Buffalo Mountains, with a considerable number of cattle, burning on the way, a few outlying homesteads and murdering three Germans who had been rash enough to remain on their farms. The news of the escape of Sandilli did not reach General Thesiger until midnight on the 9th. As many mounted men as could be collected together were sent off that night to Stutterheim a distance of 35 miles and reinforcements were sent to Kabousie, Fort Merriman, and Keiskama-hoek, while as many available men as could be got together were sent to Isidingi a point the rebels were obliged to pass in moving into the mountains. General Thesiger at once took steps to form a cordon of posts round the Buffalo mountains embracing a circumference of 60 miles, so as to prevent if possible any further move towards the Amatolas and also to prevent their passing further west into the Colony and spreading rebellion among those whose loyalty was of a very doubtful nature.

For this purpose Griffiths was ordered to hurry the Volunteers

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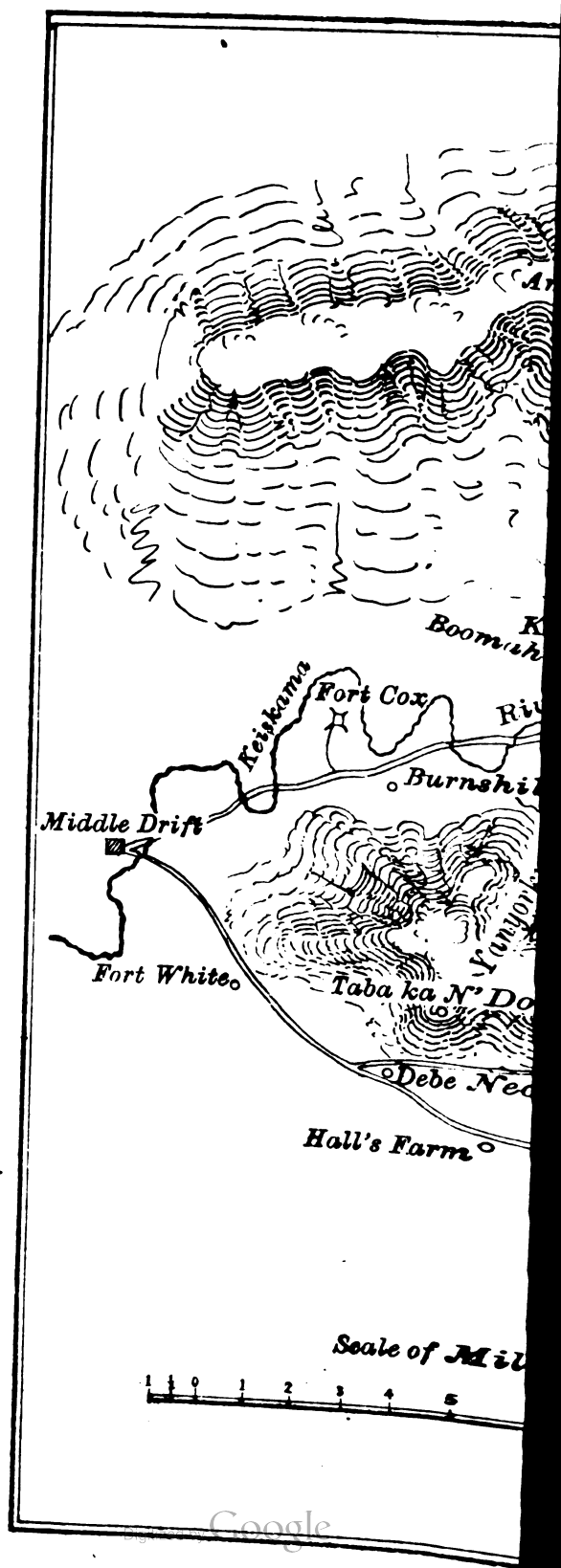
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had been serving under him from the Thomas river and every who could be spared from other districts was pushed to the front.

Although the Perie Bush had been the scene of operations in wars, and although it had been a favourite hunting ground for sportsmen at all times, it was very difficult to get any accurate information concerning it, and in the first combined operations which place a week later most of the Commanders were working very in the dark.

This Bush which clothes the southern slopes of the Buffalo Range is of vast extent and presents features of enormous difficulty for military operations.

The Buffalo Range which rises abruptly from the undulating plain, runs in general direction East and West for a distance of 20 miles. On the summit are two plateaux on different levels, the upper open, and separated from the lower, by a nearly continuous line of thick bush and stony Kloofs and water courses. This lower plateau extends from the Gozo heights to the edge of the great ravine or Kloof of the Buffalo Poort in which the Buffalo river takes its rise. It is but a mile and a half long and only about 1200 yards broad at its widest part. Its possession was of importance to the Kafirs as it was a good grazing ground for cattle and a convenient spot for them to come out into the open and sun themselves, in a season when cold and rain predominated.

It is commanded by the higher plateau, but the only approaches save from the Gozo heights, were by difficult bush paths. It consists of a series of precipices varying in height from 200 to 2000 feet, the bases of which are encumbered with huge boulders which have become detached from above and formed caves and hiding places for the enemy.

In the interstices grow forest trees and Bush which are chained together by monkey ropes, as the large and supple Creepers so common in South African forests are called; the whole combined, forming an almost insurmountable barrier to an attacking force. The opposite side of the Buffalo Poort which at its broadest part is about 2000 yards wide, is formed by a long feature which trends due south from Mount Duto, the highest point in the range. This side presents similar difficulties and its Southern extremity is so precipitous and rock-strewn as to form a fastness in which Sandilli long escaped pursuers.

This feature which is about 2 miles in length divides the Buffalo Range from another Kloof somewhat similar but not so difficult; the Eastern side of which extends away South and forms what is called Gray's Kraantz which on this side is almost inaccessible.

The slopes of Murray's Kraantz on the West side are comparatively easy though covered with thick bush extending into a Valley called the Gwengwe from a stream which takes its rise near Isidingi and falls into the Buffalo as it issues into the plain. Proceeding round the range, at the foot of the Buffalo Poort is Hayne's mill (thus named from the owner of a saw mill there). It was here that General Thesiger and the Head Quarters took position at the commencement of operations. Continuing west along a road running parallel to the base of the mountains is Perie Mission Station 5 miles from Hayne's mill.

This Station from its position close to the edge of the Bush and the sympathy felt by the Christian Kafirs with the rebel cause was a constant thorn in the General's side. Information as to our movements and supplies were for three months furnished to Sandilli notwithstanding the assertions to the contrary of the Missionary, and in the month of May, rebels were actually captured there, by a force which surrounded and searched the Kraals. At a distance of 5 miles from Perie is Bailie's Post situated on a neck where there is a break in the Bush, and on a level considerably lower than the plateau above.

Past it runs the main road from K. W. Town to Keiskamahoe which continuing from thence over a long spur of the Buffalo mountains called the Red Hill descends into the open valley of the Keiskama. Still moving west and skirting the range from Bailie's Post we come to Debe neck at a distance of $3\frac{1}{2}$ miles; over which towers the curiously shaped hill called the Taba Ka N'Doda (or man's head) the east side of which commands the whole length of the Yanyorkwe Valley in which severe fighting took place on several occasions and which widens out into the broad and fertile valley of the Kabula, an affluent of the Keiskama. At Debe neck the range takes a turn to the north west and runs parallel with the high road from King William's Town to Middeldrift and Fort Beaufort. The usual characteristics of Kraantz and Bush are still found to within a couple of miles of Burnshill. An important position on the Middeldrift-Keiskamahoe road. Continuing eastward and along the valley of the Keiskama and moving through the Boomah Pass, the scene of a serious reverse suffered by our troops in the war 1850, the village of Keiskamahoe is reached. This fertile valley is inhabited principally by Fingoes who under their magistrate, Mr. Lonsdale, did excellent service during the operations that ensued.

Fort Merriman is the next post in the chain. It is situated on a neck, called Kabousie neck, connecting the Amatolas with the Buffalo mountains and is distant 8 miles from Keiskamahoe. Isidingi at foot of Mount Kempt, Frankfort, and Izeli complete the circle.

The whole of the northern side of the Buffalo Range is more accessible than the southern, but still very difficult for the movement of troops. Only two roads cross the Range from north to

south at a distance of 17 miles apart, viz the Frankfort-Stutterheim road and that via Bailie's Post to Keiskamahoeck. These roads cross the lower slopes and there was no means of taking wagons on to the plateaux above. To meet this want a road was cut through thick bush practicable for light wagons from Isidengi on the east side and another from the Bailie's Post road to the Gozo heights on the west, the latter was at such a steep gradient that only wagons carrying $\frac{1}{2}$ loads (about 2000 lbs) and drawn by 24 oxen could ascend.

General Thesiger's difficulties were further increased by the smallness of the force whose services he could command. His object was to close all outlets by which large bodies with cattle and horsemen might escape, to prevent isolated parties who had escaped, from reforming and reaching locations where they could do mischief; to have a garrison at every post, sufficient to protect the stores and afford a rallying point for the well affected natives; to prevent any isolated attack on the rebels being made, but, if possible to make a combined movement against them.

The want of a sufficient native force was much felt. 1200 Fingoes were all that were available at this time and without a considerable increase it was impossible to beat the immense track of Bush with anything like success. The ordinary training of the officers and soldiers unfits them for bush fighting and it is not until they have gained experience and confidence that they can cope with the savage in this peculiar kind of warfare.

Both the 90th and 2-24th Regiments were composed of young soldiers and in order to inspire them with reliance and to guard against single men being cut off, either in the bush or in bivouack General Thesiger issued the following orders.

"The men to be told off into permanent groups of fours, either"
 "according to the regulation mode of sizing, or by selection; or as is"
 "considered to be the preferable mode, by the men choosing their own"
 "comrades, irrespective of sizing. Companies when working in exten-"
 "ded order, or in attack formation, to preserve their groups of fours."
 "This system need not interfere in any way with the instructions laid"
 "down in the drill book. On outpost duty the group of fours will"
 "take the place of the double sentry, thereby saving two men per"
 "sentry. One man remaining on the look out (stationary), whilst the"
 "other three lie down close behind him."

"The Group of fours must have a leader who will regulate the"
 "relief of sentries and take general directions on all occasions."

This plan was found to work exceedingly well, particularly in the Bush where it is so easy to lose touch and difficult to preserve the general line of advance, it gave confidence to the timid, and four men working together could hold their own very fairly if attacked, until

supported by their comrades. As regards outpost sentries it was found equally useful, although all its advantages were not tested, as the Kafirs shewed a singular want of enterprise in attacking camps or trying to cut off sentries.

Notwithstanding the inadequacy of the native force, General Thesiger determined to lose no time in attacking Sandilli and by the 17th March, a week after Sandilli's escape from the Thomas river, the chain of posts was completed in men and provisions, and orders were issued for a combined attack on the following day.

The posts from which the advance was to be made, were ;

1. Gwengwe Post, at the foot of the Gwengwe Valley under Lt. Colonel Degacher 2-24th Regiment, 200 2-24th Regiment and 2-7 pr. guns, Total 210.
2. Isidengi, Commandant Schermbrucker, Staff Officer Captain Gossett. A. D. C. 269 mounted Volunteers, and 400 Fingoes Total 669.
3. Fort Merriman, Commandant Frost, Staff Officer Major Butler C. B. 488 Mounted Volunteers and 200 Fingoes. Total 688.
4. Keiskamahoeke Colonel Evelyn Wood v.c.c.b. 65 of 90th Lt. Infantry, 210 mounted Volunteers, 125 Fingoes. Total 400.
5. Bailie's Post, Commandant Brabant 162 mounted Volunteers, 125 Fingoes. Total 287.
6. Perie Mission Station, Col. Law R. A. 290, 2-24th Regiment, 46 mounted Volunteers, 300 Fingoes and 2-7 prs. Total 636.

In all 555 Infantry, 1,185 mounted men, and 1,259 natives. Grand Total 2,899. in men and provisions, and orders were issued for a combined attack on the following day.

In the meantime the troops at the various posts had not been idle. Patrols had kept up connection along the whole line and the force of Volunteers at Isidengi had two skirmishes resulting in the capture of a considerable number of cattle and sheep which were being driven into the bush. On the 15th a party of the enemy under Matanzima (Sandilli's son) were intercepted between Isidengi and Fort Merriman and 50 killed; the casualties on our side being one officer and 3 men wounded.

On the 18th March the combined movement commenced. The instructions issued were, that the troops under Colonel Evelyn Wood should be the directing force in the attack, supported by Commandant Brabant on the right, and Commandant Frost on the left. These three columns moving from Keiskamahoeke, Bailie's Post and Fort Merriman

respectively were to sweep the Kloofs and tableland on the west and north of the Quilli Quilli Mountain into the upper Buffalo Poort Bush, in other words to clear both the upper and lower plateaux, the egress to the south being barred by a force of the 2-24th blue jackets and marines with two guns and two 2 pounder rockets at Hayne's Mill. This having been accomplished, it was intended to drive the Buffalo Poort Bush and Murray's Krantz in a north easterly direction, the outlets of which were guarded by Commandant Schermbrucker's force and by Lieut. Colonel Degacher. There is every reason to believe that had this plan been carried out on the 18th, as ordered it would have been successful; but Commandant Brabant on arriving on the heights overlooking the lower plateau perceived a quantity of cattle which was being driven into the Bush by Kafirs. This proved too strong an attraction for a force of Volunteers and without waiting for Colonel Wood he pluckily but rashly attacked, and in a short time found his force so roughly handled that he had to fall back to the column under Colonel Wood. Commandants Frost, and Schermbrucker, had, in the meantime reached the positions assigned to them, the two latter having had to move in the dark, through bush and up difficult mountain paths. Finding an action going on in the lower plateau, Frost dispatched some Fingoes and Hottentots, (about 230 men), to the head of the Buffalo Poort to endeavour to find their way down and create a diversion. But they returned reporting that there were no Kafirs in that part of the Bush and no way down. Frost then leaving a hundred men to hold the ridge he occupied, moved his force to join Wood, with a view to uniting with him in a fresh attack, but owing to the hilly nature of the ground did not reach him till 3-30 o'clock, when it was decided that it was too late to attempt any further operations that day. A combined movement by Wood, Brabant and Frost, was arranged for the following day and a report was sent to Hayne's mill, but such was the difficulty of communication that it was not till late on the 18th that the Commandant of the forces was aware of the failure of the original plan.

Commandant Schermbrucker was able to carry out but imperfectly his part in the original plan.

He had extended his left to Murray's Krantz, by sending Alexis Maclean and his Fingoes thither with a small party of horsemen, but the dense bush which intervened prevented his communicating under two hours with them and the withdrawal of Frost, to join Wood, obliged him to abandon Murray's Krantz the following day, and concentrate his force at the head of the Buffalo Poort.

On the 19th the three Columns having joined, cleared the lower plateau and the Bush on either side, while the Artillery at Hayne's mill shelled the Kloofs.

One shell directed too far to the left pitched in the midst of a circle of Fingoes who were sitting on the plateau with their Assegais piled in

the centre. It luckily burst without touching one of them, merely scorching the assegais. During this day's fighting one officer of the Fingo levies, Captain Bradshaw and 2 Fingoes were killed.

Having driven the enemy off the plateau into the Buffalo Poort, it was necessary to hold the position gained, and Frost accordingly bivouacked them for the night, while Colonel Wood and Comt. Brabant returned to their positions about a mile off on the Gozo heights.

The position Frost had to occupy was not a pleasant one, being surrounded by Bush and deep Kloofs up which the enemy could steal and their presence be unknown until close to the camp. But Kafirs are averse to making night attacks and save that several shots were fired into the camp during the night, no attempt at an organised attack was made.

During the night a terrific thunderstorm broke over the mountains drenching the whole of the troops to the skin. The horses suffered very much from the cold, and wet and sour grass which was all they had to eat.

They were unable to lie down at night as it was necessary as a measure of precaution to tie them together in a circle with their heads inwards. On the 20th General Thesiger moved from his position at Hayne's mill, Isidengi, with a view to directing from the heights a final attack to be made on the following day. Colonel Wood had planned an attack on the 20th, but so thick a mist obscured the mountains that up to a late hour operations were impossible, Commandant Frost, however, determined from his position to drive the south side of the Buffalo Poort, but the Fingoe leaders, Commandants Streatfield and Lonsdale reported the ground to be so rugged, rocky, and precipitous that Europeans could not enter the bush with the slightest prospect of success, and the Fingoes themselves were most unwilling to attempt it. By promising the Fingoes all the Cattle they could capture, they were induced to work their way through and after a hard day's work returned with a few cattle and horses, having killed 17 Kafirs with 3 casualties on their own side.

The same day Commandant Schermbrucker sent Captain Alexis Maclean's Fingoes along the East side of the Buffalo Poort, but they returned without having encountered any enemy. On the 21st the three columns under Wood ran short of provisions.

The three day's supply they had taken with them was exhausted and it was necessary to descend the heights to revictual, as it was impossible with the then state of the road on that side, for their wagons to reach them. Commandant Schermbrucker's men were in better case, as they were able to get supplies from Isidengi.

Colonel Wood had heard that Kafirs had been breaking out

along the bush towards Bailie's Post and determined in descending to beat the Bush in that direction. He accordingly ordered Commandant Brabant to descend the heights over Perie Mission Station and drive the Bush westward. Commandant Frost was at the same time to form line facing South to prevent the Kafirs breaking out towards Keiskamahoe, while Colonel Wood's own column lined the road itself and watched the wide ravine overlooking the Bailie's Grove-Keiskamahoe road. Brabant's force met with some opposition and several of the enemy were killed. Two officers Captain Ward and Donovan of the Diamond Field horse were shot, having fallen victims to a trap laid for them by the Kafirs, who imitating the noise made by cattle crashing through the bush, induced these officers to rush forward at the head of their men to intercept them. They were both shot at about 10 yards distance by Kafirs concealed behind rocks. General Thesiger arrived at Mount Kempt early on the 21st and finding that the whole of the Volunteer force were in movement as already described, and that it was necessary for them to descend the heights for provisions, felt that the final attack which he had contemplated must necessarily be postponed. The result of the four day's operations was the killing of 60 to 70 Kafirs and the capture of 60 horses and 200 head of Cattle, with a loss on our side of three officers, one policeman and four Fingoes killed, and four Europeans and 7 Fingoes wounded. 300 women and children came out of the bush and stated that they were starving, an assertion borne out by their emaciated condition. In these subsequent operations it was not an uncommon sight to see little children lying dead in our camps, having succumbed to cold and starvation in the bush. Captured women were sent into King William's Town and later on, at the suggestion of General Thesiger, were shipped at East London for Cape Town, where they are now in service. This was a severe loss to the rebels, as they depended in a great measure on their women to carry their goods and chattels and to supply them with food when in the bush. As regards the women themselves they accepted their change of residence with great sang-froid and since the war but few have returned to their husbands. It was more or less a boon to the citizens of Cape Town and its neighbourhood where these unfortunates took service and helped to swell the labor market.

The Commander of the forces now found himself confronted by a difficulty, most embarrassing at such a time. Many of the Volunteers began to return to their houses on the expiration of their three months engagement. A few were induced to remain, but the greater number left, thus reducing the already insufficient force in the field. Being now fully acquainted with the difficulties to be dealt with in driving the enemy from the immense forest in which he was concealed, General Thesiger felt that without a considerable addition to the native force under his command, it would be impossible to make any decided impression. He therefore returned to King William's Town to confer with the Governor and the Colonial Secretary on the subject.

It was determined to summon 1000 Fingoes from Fingoland itself,

but the war having passed from their border, the Fingoes refused to come out and it was only by the personal influence of Mr. Ayliff the magistrate and Commissioner in Fingoland, that they could be at length induced to move at all and he had then to accompany them to ensure compliance. Considering that it was, so to speak, their war we were fighting, their conduct was inexcusable. The fact was they had been considerably enriched in captured cattle by the previous operations and having received high pay for service in the field, 2 shillings a day and rations, had been spoilt. Had it been recognized at the commencement that they were bound to serve without pay, a far better effect would have been produced.

It was not until the 2nd April that they arrived at Isidengi. During the interval that had elapsed, operations had not been suspended and much good work had been done in making roads under the orders of General Thesiger, who recognized that the only way to deal with Kafirs in the bush was to have rides cut by which troops could enter and communication kept up in every direction.

The road through the bush from Isidengi to Mount Kempt was widened and improved and that from the Bailie's Grove to the Gozo heights made practicable; enabling Colonel Wood to provision a force encamped there. Raids were made upon parties trying to enter or leave the bush and with the concurrence of the civil authorities the mealy fields (Indian corn) in the vicinity of the bush from which the Kafirs obtained their supplies, at night, were destroyed.

On the 27th March, General Thesiger having completed his arrangements for attacking the enemy, proceeded to Mount Kempt. Colonel Wood and Commandant Frost had resumed position on the mountains, with the welcome addition of tents, and on the 28th a general attack was ordered, to at once move and clear the lower plateau. This was executed without much difficulty, notwithstanding the advantages the enemy possessed of inflicting considerable loss on our side. Very little opposition was offered and the troops encamped on the position taken, thus confining the enemy to the Buffalo Poort. During the next week the Bush was perpetually worked by the troops. It became evident, however, that large numbers of the Kafirs were slipping away and had moved towards the Taba ka N'doda. The arrival of the Transkei Fingoes on the 3rd April enabled the Commandant of the Forces to carry out his intention of thoroughly searching the Bush and on the 5th, all the paths which had been cut through the forest and all points of egress were lined by the regulars and volunteers while the whole of the Fingoes to the number of 1777, drove the Bush towards Hayne's Mill. From the reports that had reached the General of the prowess of the Transkei Fingoes he had looked for good and thorough work from them, but they proved to be an undisciplined mutinous rabble with no inclination to meet the enemy, though well led by their officers. They carefully avoided all places where Kafirs might be concealed, and distinguished themselves principally by wasting their ammunition and firing into one another.

But few Kafirs were seen, all of whom were killed, but Sandilli had, it was believed, never left the bush, being concealed in a large rock surrounded enclosure with a considerable guard.

General Thesiger had proceeded to Hayne's Mill on the 5th, and that evening received a report from Captain Warren R. E. Commanding the Diamond Field Horse who was at Debe Neck that a large force of the Kafirs of Sali's, Kama's, and Leyolo's tribes had crossed towards the Taba ka N'Doda. Taking position to intercept them an action had ensued in which 40 Kafirs were slain, the remainder making good their way into the Bush. Leyolo whose name was well known in the war of 1850, was the bravest of the chiefs who fought against us at that time and received then the name of the "Lion." He appeared to have lost none of the fire of his youth and proved in the engagements that followed, to be the most formidable of our enemies. It is somewhat remarkable that he should have taken up arms at a time when Sandilli had been roughly handled and his men more or less discouraged by perpetual harrying. The probability is, that lying stories had been circulated that our troops had been defeated and that it was only necessary for the other tribes to rise to complete the extinction of the white soldiers and volunteers. It was a curious feature in the war that when the fortunes of the enemy were at the lowest they were always receiving recruits from tribes which had hitherto remained quiet. On receiving Captain Warren's report General Thesiger determined to march early on the following day to Taba ka N'Doda and attack Leyolo. The 1000 Transkei Fingoes were ordered to march at 1. A.M. for Bailie's Post and a company of the 2-24th and two Guns under Colonel Law were at once dispatched to Perie with orders to march at daybreak to the same place. Orders were sent to Colonel Wood to move the whole of his force from the heights and to march with his mounted men and Fingoe levies by the valley of the Kabula to the neighbourhood of Burnshill where he would be in a position to stop any attempt on the part of the rebels to force their way into the Amatolas. By midday on the 6th, the attacking force was in position. The bush South of the Taba ka N'doda Hill was shelled and beaten by Fingoes and cleared without any difficulty. At about 2 o'clock the mass of the enemy was found to be in the Bush on the north side of the hill, and a division of the Fingoes, 500 strong, was sent in. The Kafirs principally Leyolo's men, fought well and drove the Fingoes out of the Bush killing Captain Webster, and pursuing them into the open. Their further advance was however checked by the fire of Captain Tongue's company of the 2-24th which was placed so as to sweep the valley. At this time Colonel Wood's force appeared on the opposite heights and took position to cut off the enemy attempting to escape in that direction. After the repulse of the 1st Division of the Fingoes some difficulty was experienced in inducing the 2nd Division to enter. Many of them by their reckless expenditure of ammunition the day previous had none left, and it was only after great delay that a fresh attack was made and the Bush cleared. Failing

To the north-west
the British Pass





it. Tambookei land still held parties of rebels and Major Elliott was operating effectively against them.

In the Transkei all was quiet; but Kreli still evaded capture and it was not advisable to reduce the forces at Ibeka, Idutywa, Fort Bowker, Malam Mission Station and Beachamwood for fear of a return of the Gealekas.

Colonel Palmer had reported the Kroome Mountains clear, Tini Macomo having joined Sandilli in the Perie Bush.

During the cessation of hostilities General Thesiger took the opportunity of visiting this district and assuring himself of the clearance of the mountains of the enemy. He arranged with Colonel Palmer to withdraw all available men of the 90th to join Colonel Wood, leaving the duty of preventing a return of the rebels to the Volunteers and Burgers.

In the meantime the Kafirs in the Buffalo mountains had not shewn any great signs of activity. They had received considerable reinforcements, but beyond attacking the Fingoes in the Kabula Valley and burning some Fingoe Villages and carrying off cattle they did not make use of the opportunity afforded them of harassing our troops.

On resuming hostilities General Thesiger determined to attack the enemy in the Yanyorkwe Valley first, and then turn his attention once more to the Buffalo Poort. It was difficult to prevent this intention being known to the Kafirs, as no place was safe from their spies; but it was believed that they were so far deceived as to believe that the Perie Bush would be the first point of attack.

The Posts round the Taba Ka N'Doda bush had been gradually strengthened by the addition of more troops and on the 30th April the following positions were held by a force numbering 1584 Europeans, Regulars and Volunteers; 2,400 natives and 69 guns.

Bailie's Post.
Hall's Farm.
Debe Neck.
Fort White.
Figland's Farm.
Burnshill.
Yellow Wood Drift.

This force was, for the attack of the 30th April, combined as follows.

Bailie's Post, Head Quarters.

Lt. Colonel Degacher	2-24th Regiment.
Royal Artillery 4-7 prs.	60 men, Major Harness.
2-24th 4 Companies	320 „ Major Black.
Total	380

Burns Hill, Head Qrs.

Colonel Evelyn Wood v. c. c.B.

Royal Artillery 4-7 prs.	36.	men,	Captain Smith.
5 Companies 90th L. I.	540.	men,	Major Cherry.
Diamond Field Horse	118.	„	Major Warren R. E.
Fingoes.	500.	„	Comt. Streatfield.
Do.	500.	„	Comt. Lonsdale.

 Total 1,694.

Debe Neck, Head Qrs.

Commandant Von Linsengen.

Hermansdorp Volunteer Horse 60.

Grahams Town	Do.	76.	Captain Sampson.
Viucents	Do.	40.	
Panmure	Do.	39.	
Buffalo	Do.	105.	
Fingoes.		500.	Captain Ronald Maclean.
Siwani's Kafirs		300.	Captain Clarke

 Total 1,120.

Kabula Valley.

Major Buller C. B. 60th Rifles

Frontier Light Horse	80.	men
1 Company 2-24th Foot	75.	„
Total	155,	„

Attached :

Fingoes	600.	Captain Alan Maclean.
Somerset Vol. Horse	175.	Captain Comley.

 Total 775.

Orders were issued to the various Commanders to leave their Camps on the 30th April so as to attack the enemy at daybreak. The forces had been disposed so as to advance from all points and leave no part of the Bush untouched.

Lieut. Colonel Degacher's force, with which was the Commander of the Forces and his Staff was ordered to move from Bailie's post to the ground near the Taba Ka N'Doda.

Colonel Wood's force to advance in two Columns. On the left Streatfield's and Lonsdale's Fingoes supported by two Companies 90th Light Infantry to move from Yellow Wood, beat the drift and bush towards the Taba Ka N'Doda on the right (west) side of the Yanyork-

we Valley, with some horsemen watching the outlets towards the Kabula.

On the right 3 Companies 90th Light Infantry, 4 guns and Diamond Field Horse to advance from Burnshill and Makabalekile Ridge on to the open ground west of the Taba Ka N'Doda.

Commandant Von Linsengen's force to move up the Burnside Bailie's Post road and beat the southern slopes of the Taba Ka N'Doda in a westerly direction and work its way eventually on to the open ground on which Colonel Wood's Column from Burnshill would debouch.

Major Buller's force to move to the ridge between Yanyorkwe Valley and Congo stream.

Alan Maclean's Fingoes to beat the Eastern side of the Yanyorkwe Valley.

The Graham's Town Volunteers to watch the bush on the South Side of the Taba Ka N'Doda and prevent the rebels from breaking, in a South Westerly direction.

Captain Comley's volunteers to watch the bush from the Taba Ka N'Doda to the Perie Bush and endeavour to prevent the rebels from crossing from one to the other.

By daylight Colonel Degacher's column arrived near the Taba ka N'Doda without meeting any of the enemy. Some mounted scouts of the 88th were pushed forward to the edge of the valley and reported that a large force of Kafirs were assembled on the opposite plateau. The guns were at once got into position and a well directed fire opened at a range of about 1700 yards. The enemy at once divided; one party moving rapidly towards the point where Colonel Wood's Right Column was advancing and the other towards the valley with the evident intention of attacking Colonel Degacher.

These latter, however, came under so heavy a fire in the valley, that they altered their intention and took to the Bush below. At 6-45 A.M. heavy firing was heard in Colonel Wood's direction. Lying in ambush in the strip of Bush at the summit of a steep hill (see A in plan) up which the force had to ascend—a large body of Kafirs, reinforced by those who had moved thither on being scattered by the fire from Major Harness' guns, had opened fire on the advance Guard consisting of Captain Steven's Company of the 90th Light Infantry and 2 guns under Captain Smith. The rebels fought with great spirit and held their ground for some time. Some of them being shot down at close quarters. Captains Stevens having been severely wounded had to hand over the command to his subaltern, Lieut. Saltmarshe, who was himself a few minutes later shot through the heart. Captain Smith now managed to get his guns into action and fired case into the bush at a distance of

30 yards and Colonel Wood directed Major Cherry to take command of the advance and move rapidly forward by short rushes. This was done and the Bush cleared, the enemy flying in all directions. In addition to Lieut. Saltmarshe, 4 men were killed and 3 wounded in this affair. In the meantime the Fingoes under Lonsdale and Streatfield had moved into the Tutu Bush and were heavily engaged.

Major Buller who had arrived at the point directed and finding the ridge clear of the enemy had been ordered to descend with 50 of his men (dismounted,) and one Company of the 2-24th. This force reinforced by another Company of the same Battalion from Colonel Degacher's column cleared the Bush (at the point B) and effecting a junction with Colonel Wood assisted in beating the Bush towards the Fingoes. Von Linsengen's force had in the meantime cleared the Southern slopes of the Bush between the Taba Ka N'Doda and advanced along the Valley towards B and given a hand to Wood. The loyal Kafirs of Siwani's tribe belonging to von Linsengen's force, fought very well, showing no signs of reluctance to engage with men of their own tribe who had joined the rebel cause.

Captain Alan Maclean's Fingoes assisted by 3 Companies under Colonel Degacher searched the eastern side of the Yanyorkwe Valley and by sunset no part of the Valley and Kloofs had been left untouched. A large number of women and children came out of the bush during the day and gave themselves up. The Bush in some parts was very dense and the fatigue to the troops very great but the combined movement was so well arranged that the Kafirs found their egress barred at every turn and received a lesson which after the long suspension of hostilities was much needed.

On one occasion a body of Kafirs finding themselves hemmed in, placed their women in front of them and effected their escape; knowing that the soldiers would not fire for fear of hitting the women.

The loss of the enemy actually killed was 141, our loss (with the exception of the men of Captain Steven's Company who fell) was trifling. During this action, flag signalling was found very valuable. It was impossible to communicate with Colonel Wood's column under an hour by a mounted messenger although the actual distance across was under a mile and General Thesiger not only received reports of the progress of the action, but was able to send orders during the day.

Sandilli, Leyolo and Tini Macomo were reported to be in the bush but they escaped, having probably concealed themselves in some caves the existence of which were not known to the Commander of the forces until some days later.

The action of the 30th April had carried demoralisation into the ranks of the enemy. They had never before been pushed so vigorously in the Bush, by both Europeans and native allies; and the effect was

all the greater from the immunity they had enjoyed during so long a period of forced inaction on our side. During the night many broke away and made for the Perie Bush and elsewhere. To intercept any body from crossing near Bailie's post, Alan Maclean's Fingoes had been placed on the neck to guard the open space they would have to cross in order to get to the Perie Bush. But the Fingoes performed this duty so badly, that a body of Kafirs, strength unknown, managed to pass at about 4 o'clock on the morning of the 1st May. Coming suddenly on Maclean's Camp, the situation of which was evidently unknown to them, they were fired on by a sentry, who fled, and the Fingoes thinking they were attacked, started up firing wildly and scattered in all directions in a state of panic, leaving their Commandant standing alone in his camp. The Kafirs equally frightened fled across the open and made good their way to the Bush, dropping saddles, blankets, &c., in their hurry and alarm. A number of women were with them, but they were too frightened to follow and remained concealed till daylight when they gave themselves up to the force which was sent in to search the Bush from the Taba Ka N'Doda to Bailie's post. On hearing the sound of the firing General Thesiger dispatched a Company of the 2-24th to reinforce the Fingoes and occupy the neck, which barred any further passage across.

A few hours after daylight on the 1st May a force under Major Butler consisting of 2 Companies 2-24th, 2 guns, the Frontier Light Horse and Maclean's Fingoes commenced to beat the Bush from the Taba Ka N'Doda, but found few of the enemy.

The women above mentioned who gave themselves up, were at once sent off to King William's Town and shortly afterwards shipped, with those captured the previous day, to Cape Town.

The same day von Linsengen scoured the Bush from Debe neck, killing and capturing a few Kafirs. There was still reason to believe that the Yanyorkwe Valley was not yet clear and the Commander of the forces determined to satisfy himself on the point before he turned his attention to Sandilli in the Perie Bush.

It was known that Leyolo and other chiefs had been in the Bush on the 30th April and some surprise was caused by their not having been seen. They had however never left the Bush, having concealed themselves in some Caves formed by fallen boulders under a Kraantz on the East side of the Valley opposite the position taken up on that day by Major Harness' guns. They evidently counted on the withdrawal of our forces after the 30th April and their place of concealment was discovered by accident. On the 2nd May a force consisting of 2 Companies 2-24th and two guns under Lt. Col. Degacher together with Commandant Von Linsengen's force, was ordered to search the valley. They found it almost clear of Kafirs and late in the afternoon were emerging from the Bush when one of Siwani's Kafirs of Von Linsengen's force passed by a cave where one of Leyolo's men lay concealed. He

offered so tempting a shot that he was fired at and killed. Von Linsengen at once took steps to surround the spot and found that Leyolo was there, with, it was stated, "Tini Macomo," Sandilli's youngest son "Bisset Sandilli" and two other chiefs.

Bisset Sandilli had only joined the rebels a week or two before this, having up to that time remained with the Christian Chief "Kama" a son of Kama our ally in the war of 1850 at Middledrift. The day before he left, the Magistrate's wife at Middledrift had been talking to him and he had expressed to her the pleasure he felt at not having joined his father. The same night he stole a gun from one of the residents at Middledrift and decamped. Von Linsengen made every endeavour to induce Leyolo to surrender, but without avail. The fact was, they knew the ground better than the men who had hemmed them in, and trusted to be able to pass through the cordon at night. They were moreover complete masters of the situation, being well armed with about 50 followers, and no one was bold enough to face almost certain death by attacking the caves. The next morning a report went forth that the chiefs had escaped and the capture of one of their chief councillors, an old man, revealed an almost impracticable path which they must have taken. Most of their followers however remained and were attacked in their fastness, and 21 men killed, with a loss on our side of 4 men.

It was now evident that the Yanyorkwe Valley was clear, and General Thesiger was able to turn his attention to the Buffalo Poort where Sandilli still remained, his force having been considerably reinforced by the fugitives from the action of the 30th April. On the morning of the 3rd a large body of Sandilli's men were reported to be massing on the heights above Keiskamahoe, and Colonel Wood received orders to move and attack them, but they anticipated his movements by making a descent on the Fingoe Farms in the Valley, and carrying off 100 head of cattle and 300 sheep. This part of the Valley had been watched for sometime by 150 Fingoes under Captain Develing. He at once sallied out and attacking the rebels drove them back up the mountain and recaptured all the cattle and sheep but ten, with a loss of 4 men only, 22 of the enemy being killed. This raid by the rebels was made with the object of replenishing their exhausted Commissariat and all reports that came in, described them as suffering severely from hunger.

General Thesiger now returned to King William's Town for a few days while the troops were getting into position to engage Sandilli in the Buffalo Poort. A few days after, driven by hunger, another raid was made by a party of rebels at night in the direction of Frankfort where they managed to secure 90 head of Cattle and drive them into the Bush. The loss of their women and the destruction of the mealie-fields left them almost entirely dependent on cattle, and Sandilli and his son Edmund Sandilli or "Gonga" (his Kafir name) would them-

selves have been as badly off as their followers, had it not been for the complicity of the Christian Kafirs at the Mission Station at Perie, who kept them supplied with liquor and groceries. No mention has, up to the present, been made of Edmund Sandilli, but he is worthy of notice, having been brought up as a Christian and well educated. He had visited England and had held the post of clerk, in the Magistrate's office at King William's Town. He proved one of the most dangerous of our enemies and it is said that he was instrumental in egging on his father to continue the war. In order to keep the day of attack secret, General Thesiger remained in King William's Town until it had arrived, when he rode out with his staff to Hayne's mill. The movements ordered were as follows.

Colonel Wood's column consisting of 5 Companies of the 90th L. I. Lonsdale's Fingoes 760, and the Somerset volunteer horse, 175, with 2 guns, to move from the Kabula valley to his old position on the Gozo heights.

Lt. Colonel Degacher's column viz 2 Companys 2-24th Regiment 157, and Allan Maclean's Fingoes 550, from Hayne's Mill by a path, which had been cut under Colonel Wood's orders in March, to the Gozo heights.

Commandant Von Linsengen with 180 volunteers, 500 Fingoes and 300 Siwani's Kafirs, by another path to the left of that taken by Colonel Degacher, Major Buller with 2 Companys 2-24th the Frontier Light Horse 188, Streatfield's Fingoes 500, from Mount Kempt to the lower plateau by a path which had been cut for the purpose of enabling a force to move from the upper plateau, followed by Commandant Schermbrucker with 185 Mounted Volunteers.

Captain Surplice with 1 Company 2-24th 80, and 200 Fingoes under the command of Mr. Haynes the owner of the Mill of that name, to move from below, to waylay a path which had been cut from the mill to the foot of the precipice.

2 Guns, 1 Company 2-24th 80 men, 80 Hottentots and 40 Volunteer Horse remained at Hayne's Mill.

Starting before daylight each column moved into position and the lower plateau was gained without opposition, the rebels flying to the rocky Kraantzes below. Unfortunately Captain Surplice's Company under the guidance of Mr. Haynes, took the wrong path and enabled a body of some 300 Kafirs to escape by the one they were ordered to waylay. This mistake quite upset the plan and was the cause of considerable loss of life for believing the force to be in position as ordered, Major Buller on arriving at the lower plateau went with 5 men down the Kraantz to reconnoitre. He suddenly found himself exposed to a very heavy fire from the enemy concealed behind rocks which killed one man and wounded another. Sending one man to bring his

men down, he was in the unpleasant position of having a large force firing at him and only two men with him. However a party of Volunteers came to his assistance but they were so unsteady and fired so wildly that they were worse than useless and actually shot two of their own men. Their fire was however so far effective that the enemy were afraid to emerge from their position. Major Buller's own force, the Frontier Light horse now came down and while Captain Macnaghten was forming them for attack he and two troopers were shot dead and Captain Whalley and one man wounded.

It was not until an hour had passed and some Fingoes under Lonsdale had come up, that the position was stormed and carried with the loss of two more men, the enemies loss being only 15. This action was a good example of the difficult nature of Bush fighting and the power a few determined men possess of keeping a large force at bay. Major Buller who throughout was in much danger not only from the fire of the enemy, but also from the wild fire of the Volunteers, behaved with great gallantry. Colonel Wood had in the meantime sent a part of his force to turn the position, but before they could arrive it had been carried. But little further worth recording transpired during the day and the troops returned to camp.

On the following day another attack was made on Sandilli's cave but no Kafirs were found. It was evident that large parties had left the bush and reports were received that some of them had returned to the Yanyorkwe Valley. Colonel Wood was ordered to build a small fort on the Gozo heights and to take command of the forces operating on that side, while General Thesiger returned to Bailie's post to superintend operations in the Yanyorkwe Valley his object being by perpetually harassing the enemy to prevent their re-assembling any where in any force. On the 13th May the rebels in the Yanyorkwe Valley were attacked by Von Linsengen's column, Alan Maclean's Fingoes and a volunteer mounted force (Bowker's Rovers); 50 Kafirs were killed. The same evening a report was received from Colonel Wood that Commandant Lonsdale and his Fingoes had moved before daylight from the Gozo heights, to Sandilli's Cave and surprised some 500 Kafirs. This was a most spirited affair and Lonsdale's men behaved well, closing with the enemy in the strong position they held, with their assegais and killing 47 with no great loss on their side.

The prisoners taken describe the rebels as greatly disheartened and straitened for food, and there was no doubt that the orders issued to Commanders never to cease harassing them night and day, was the cause which brought the war so rapidly to a close. This could not be done without great fatigue and hardship to the Europeans as well as native forces, but there was no flagging on either side and the work was performed with great pluck and energy. Sandilli now began to shew signs of a disposition to surrender and sent messengers to King William's Town to say he wished for peace. In reply he was informed,

that his unconditional surrender and that of the other chiefs were the only terms that could be allowed him and at the same time orders were issued not to relax the efforts which were being made to effect his capture.

Sandilli's following in the Bush was now considerably reduced. He had quarrelled with Leyolo, who accused him of cowardice and left with his men for the Fish river Bush where a force was sent to dislodge him, not much apprehension was caused by this move of Leyolo's, as food was scarce in the Fish river District and it was expected that he would soon have to leave it for subsistence. Tini Macomo had also left and returned to his old haunts in the Water Kloof, causing much alarm, and a call for troops by the Officer Commanding at Fort Beaufort but General Thesiger rightly judged that there was little to fear in that quarter, and if it was necessary to operate against so pitiful an enemy, as Tini Macomo had proved himself to be, the Burgher forces in the District were quite sufficient. Tini Macomo was shortly afterwards captured near Fort Beaufort.

During the remainder of the month of May operations were continuously carried on in the Perie Bush under the direction of Colonel Wood, parties of troops taking up their quarters for two or three nights together in the Buffalo Poort. At length half starved and with his forces reduced to a handful, Sandilli fled to the bush near Isidengi, where a chance shot from one of Commandant Lonsdale's men killed him and his body was found a few days afterwards deserted by the men he had brought to ruin, and mangled by rats. It was taken to Isidengi and buried. With him fell Dukwana, one of his body guard, a brave man and of considerable influence. He was a Christian and belonged to the Presbyterian Mission Station at Umgwale; but though an elder of the church and looked up to as one of their shining lights, he preferred casting his lot with his Chief and drew several other Christians with him. He was a good shot, as most Christian Kafirs are, and many a white man is said to have fallen to his rifle. There was much that was noble in the man, and one can hardly blame him for his attachment to his chief, although he must have known that the end could only be disaster and ruin to his tribe. Shortly afterwards Leyolo also fell by a chance shot in the Fish River Bush. With the death of these chiefs the rebellion collapsed with a suddenness which was almost startling. The armed bands that had followed them disappeared, and save a few marauders, the war, which the wisemen of the land had prognosticated would last for another year, was over. Attempts were made by interested people to induce the Colony to believe that large bodies of rebels were still in the Fish river bush, the Chichaba Valley and elsewhere, but the patrols which scoured the country, proved that such was not the case, and save small bands of half starved wretches, it was evident that the bulk of the rebels had dispersed. Several influential men either surrendered or were captured and at the beginning of June the only men of any note in arms were Mackinnon Umhala and Dimba.

The two sons of Sandilli; Edmund and Matanzima were hiding in the Thomas river District. They were captured shortly afterwards and on the 18th June, General Thesiger was able to report the war at an end. All was quiet in Gcalekaland. Krela who had so long escaped capture was still at large and although several attempts had been made to surround him in the Udweassa forest, he eluded his pursuers and was said to have escaped to Pondoland, where Umquikela gave him an asylum. Thus ended the Kafir war of 1877-78. Although no great battles had been fought the labour and hardships undergone by the forces both Imperial and Volunteer had been very great, and the Colony acknowledged that never before had our supremacy been so rapidly re-established, and every move of the enemy anticipated and met so ably as in the operations in the Buffalo Mountains.

During the month of May, disturbances had occurred in Griqualand East and Griqualand West, and Volunteer forces had been collected to quell them. In the Transvaal, Secoceni whose tribe occupies the difficult country north of Lydenburg had been giving trouble, and Colonel Rowlands V. C. had been sent to organise a force to attack him. The hostile attitude of Cetewayo the Zulu King had for a considerable period kept the Colony of Natal in a state of apprehension, and General Thesiger, as soon as he could do so with safety, dispatched the 90th Lt. Infantry, the Frontier Light Horse, and Major Harness' Battery overland to Natal. Later on, these were followed by other forces and the Head Quarter Staff moved to Pietermaritzberg.

The operations which were and are being carried on in these several districts will form subjects for another paper.

II.

INSTRUCTION PRATIQUE SUR LE SERVICE DE
L'INFANTERIE EN CAMPAGNE.

PART I.

Within the last twelve months, there has been published by the French ministry of war a small handbook with the above title. Its object, as the introduction sets forth, is "to depict in an easy manner to the Soldier, the Corporal and the Serjeant as well as to the Officer the line of conduct to be observed in the different circumstances which war presents." How that object has been effected, it will now be our purpose to enquire, for we believe that the analysis of such a book as that before us, cannot fail to indicate many blemishes in our own system and to show us where improvement is feasible and advisable. Broadly speaking the manual consists of five parts, the 1st deals with "Outposts," the 2nd with "Route marching" (service de marche) the 3rd "Reconnaissance," the 4th "cantonments and bivouacs," and the 5th with "miscellaneous subjects" such as convoys, requisitions, surprises, ambuscades, destruction of Railways, telegraphs etc. so that it may be said to contain instruction in all those matters which drill books usually either ignore, or at most treat in a very superficial manner.

But it is not only in France that such a manual of instruction is requisite. The want of detailed direction in these matters has till lately been very conspicuous in our own service, and such a manual would even now be readily welcomed by the Non Commissioned ranks of the army. The new drill book certainly deals with outpost duties more minutely and thoroughly than the old, but it still leaves much to be desired under that heading, and it omits all mention of those other subjects to which we have alluded, and with which it is so desirable the lower grades should be conversant.

It may be said that current military literature amply supplies all wants in this respect, but such literature is not as a rule within the reach of the non-commissioned ranks, and moreover a book requires the stamp of authority to make it acceptable in the eyes of the soldier. The words "Published by authority" convey to him the idea of infallibility, he reads and believes, he places implicit confidence in all the precepts they inculcate, while without those talismanic words he is incredulous and sceptical. If then the Non-Commissioned officer is to be conver-

sant with these matters, he must have the means of instruction therein placed in his hands.

Again, not only is there a general want of instruction but such instruction as there is, is to a great extent devoid of system. The recruit is taught outpost duties etc., in a haphazard, unintelligent manner without either method or explanation, unless indeed he happens to be singularly fortunate in the Adjutant and Drill Sergeant under whom he falls. Now in the French army the same lack of system was experienced, and it was partly with a view to remedy this, partly that the soldier might have a regulation manual to which he could turn for instruction, that the "Instruction Pratique" was issued by the minister of war.

The manual is as we have already stated divided into five parts, the first dealing with the subject of outposts. But before the recruit is instructed in the duties pertaining to outposts, he is taught the military value of natural features, and how to describe them. The manual therefore first lays down how the "Exercices préparatoires" are to be conducted. It directs that each section commander should take his men if possible to some elevated spot, and from thence point out to the young soldiers, the various objects visible around, taking care to explain to them their military value and the designations employed for them in military parlance. Thus the recruit becomes acquainted with the exact meaning of such terms as close and open country, ravines, right and left banks, cuttings, embankments, viaducts, aqueducts etc, terms which though familiar enough to most people are more or less unknown to uneducated men. These objects having been described some old soldiers are sent to a distance with orders to approach, retire, to get under cover, etc, the instructor meanwhile explaining to the recruits the advantages and disadvantages of the ground traversed. He shows them how to conceal oneself from an enemy, how to approach without being discovered. He practises them in transmitting clearly and precisely any order or piece of intelligence, he defines those military expressions which are of every day occurrence as right and left wing, flank, rear etc. He teaches them how to find their way about in a strange country by means of the sun or the stars. In fact his aim is to develop the intelligence of the recruit in every possible way and to fit him for those duties which will afterwards be required of him. The elementary instruction of the recruit completed, he is initiated into the mysteries of outpost duties, and here again instruction is carried out, on a methodical rational system. It is divided into four parts. The first, consisting of lessons on the conduct of outposts with reference to the observation and surveillance of the enemy. The second, comprising all details relative to rounds, patrols, flags of truce, deserters etc. The third, consists of the exercise of two sections opposed to one another. The fourth part, of outpost duties by night.

The method of instruction adopted is as follows. The section

commander divides the old soldiers into two bodies the one to represent an enemy the other to act as outposts under the eyes of the recruits. The way the sentries are posted, how they are relieved how they maintain communications with one another, how they act when attacked by the enemy, the steps taken when a reconnoitring patrol of the enemy is discovered, these and all other matters are exemplified before their eyes. The young soldiers are then associated with the old ones, a young and an old soldier being placed together on each post, and the same series of exercises is performed, after which the recruits are left to act alone unassisted by old soldiers. Finally they are disposed in detached posts, examining parties etc.

In the second stage, the course adopted is somewhat similar, the young soldiers watch the old soldiers and observe the way in which they conduct themselves in the presence of rounds, patrols, flags of truce, deserters etc. They themselves are then associated with old soldiers, and finally they are left to act alone. Having thus been thoroughly instructed in their duties as sentries, they are next taught how to act as reconnoitring patrols. The detachment of old soldiers sent out to represent the enemy, throws out sentries, and a "creeping"* patrol of old soldiers is despatched to reconnoitre their position, falling back as soon as they have been discovered by the enemy. The young soldiers are meanwhile stationed on some commanding point from which the march of the patrol can be observed, they are then sent out to repeat the movements they have seen performed.

In the next stage of instruction two sections are opposed to one another under the supervision of the Captain of the company, who selects the ground and the position to be occupied by each, taking care to place them sufficiently far apart to enable them to conceal their sentries with comparative ease. According to instructions, patrols are then sent out by one of the parties, the Captain acting as umpire and deciding whether or not it has succeeded in carrying out its intentions. The commander of each section is expected to furnish a report of his proceedings accompanied by a sketch of the position.

In the fourth and last stage, outpost duties by night are taught, the method employed being as follows. The men are first taken to a position which they know and have occupied by day, where after dark the same exercises are repeated, they are then taken about an hour before nightfall to a new bit of ground, which is occupied for the night in the manner considered most suitable, patrols being sent out, and every thing conducted as if on actual service. Finally the section is marched out after dark to occupy a position with "irregular outposts" as might happen on service when a force arrived on its appointed ground after nightfall. The nature and composition of these irregular outposts will be explained hereafter.

* *A creeping Patrol (patrouille rampante) corresponds to our reconnoitring patrols and consists of a corporal & two men.*

This finishes the instruction of the section, the exercises which succeed are rather for the edification and training of the officer than for that of the recruit. And for this purpose larger units are employed.

INSTRUCTION OF THE COMPANY.

The practical instruction of the company is always to be carried out on varied ground, the company being supposed to form the outposts of a battalion. The training of the company is divided into three periods. In the first the enemy is assumed to be in a certain direction, in the second, two companies are opposed to one another, and in the third, night duties are performed. In the first period a company marches out as if on service, the supposed direction of the enemy, the position occupied by the force the outposts are intended to cover, and the amount of ground allotted to the care of the company are duly pointed out. The company has to provide a support as well as two or more picquets* so that unity of purpose and command is obtained from front to rear. The method of throwing out the sentries, and the various exercises that follow vary but little in detail from that which obtains in our service.

INSTRUCTION OF THE BATTALION.

This is divided into two parts, the first is executed by a battalion, representing the outposts of a brigade. Two companies are told off as the reserve, the remainder give the supports and picquets. If two battalions are told off for outpost duty, one furnishes the reserve, the remainder of the outposts being supplied by the other battalion.

In the second period two battalions are opposed to one another under the supervision of a superior officer. In this way every phase of outpost duty is impressed on the soldier, step by step he learns its nature, and at last grasps the general idea which these repeated and progressive exercises are intended to convey. Instead of being an unreasoning, unthinking machine, he becomes an observant, intelligent and valuable unit in that force to which the security and repose of an army is entrusted. It is only by such a systematic and progressive training that we can hope to attain thorough efficiency in the conduct of outposts.

Having laid down the system on which all instruction is conducted, the manual next proceeds to explain the general principles to be observed, the duties of the different sections which compose the outposts,

* It must be borne in mind that a French Battalion consists of 4 companies, each equal to at least two of ours.

the duties of individuals whether commanders or sentries, the conduct of patrols, and in fact all matters requiring explanation, and in all these details much may be found which is worthy of remark and of imitation in our service, details which at present are often left to the individual intelligence of some country lad fresh from the plough. We propose briefly to notice such principles as deserve attention, and such details as differ from or are omitted in our official Instructions.

In the chapter dealing with "General Principles" certain rules are laid down which it is considered advisable to adhere to if possible on *all* occasions. Thus :—"a reserve to the outposts is only necessary when the force to be covered consists of a brigade or larger force." It must be remembered that in France a Brigade means six battalions.

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"The reserve should be equal in strength to the remainder of the outposts." Its special duties are more thoroughly described than in our drill book.

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"Picquets and Supports should be furnished from the same company" that is to say each company forms a separate organized group in the outpost line, which group consists of a support and a certain number of picquets.

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"The outposts should be placed at such a distance that the force covered by them should at all events be out of range of artillery fire, that is to say at least 3,000 paces." This of course does not apply to small bodies,

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In Chapter II, "Duties of Sentinels," it is laid down as an axiom that "if adjoining sentries cannot see each other they must at least see a portion of the ground under the observation of the other, so that no one can pass between them without being seen." With reference to the posting of sentries nowhere in our books is to be found a rule at once so simple and so intelligible.

Another sensible axiom is that "the advantage of seeing and not being seen oneself should never be sacrificed to that of observing still further."

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"When people approach who wish to cross the line of sentries, they are to be halted, if they do not obey after being twice summoned, or attempt to force the line, they are to be fired on."

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Deserters :—"If deserters from one's own side cannot be stopped

they should be fired on, if they succeed in escaping all watchwords and signals should at once be changed."

"If deserters from the enemy approach they should be halted a hundred yards off and ordered to lay down their arms, dismount, unsaddle their horses, and move away from their arms, till such arms have been taken possession of, etc."

"Flags of truce should be halted a hundred yards off and made to turn about till the responsible officer has been acquainted of their presence and given his orders thereon."

"As at night one must depend more on the ears than the eyes, sentries should avoid covering up the ears and head and for the same reason they should not be placed near mills or waterfalls."

"If shots are heard, one of the double sentries nearest the spot should endeavour to ascertain the cause."

"If fires are permitted, sufficient turf or earth should be heaped up close at hand to extinguish them at once if necessary."

Numerous other extracts might be given to show how fully and how carefully the subject has been handled, but the above will suffice to show that the conduct of the soldier on outpost duty has not been left to the discretion of untutored minds. If a perusal of his "Instruction pratique," and the constant practice he undergoes is not sufficient to ensure the French Soldier's efficiency in this branch of instruction, nothing ever will raise him above the condition of an unthinking military machine. The French soldier has no excuse for ignorance. The Briton has every plea to offer. He has no suitable Guide book, he has little practice, and what he has is of a very unpractical kind. When a regiment goes out for outpost duty it is the officers only who learn anything. The why and wherefore of things are seldom explained, and no means taken to impart an interest to operations which should have every appearance of reality. Moreover the common soldier often goes out on such occasions to take a part for the first time in duties, of the very rudiments of which he is entirely ignorant.

In the matter of Patrols too, the Instructions are most minute in the details laid down for their conduct. Instead of merely laying down a general rule about sending out reconnoitring Patrols, these instructions record how they are to march, what precautions should be taken, and how they are to act under various circumstances. For instance they say:—

"In a reconnoitring patrol, the men march at intervals according to circumstances, one of the three being detached towards the menaced flank. They should be sufficiently close to see each other, and to lend mutual support, sufficiently distant to avoid being all cut off or taken prisoners together."

In our service send out a Corporal or Naick in charge of a reconnoitring patrol, and how rarely will he take such precautions. Whereas in France if he did not do so, he would be the butt of the Barrack room.

Again "the commander of the Patrol communicates to his party, the object in view and all the information he himself possesses, so that should the patrol be forced to separate, each one of them may be able to make a correct report. Moreover a rendezvous is pointed out on which the party can re-assemble."

It is needless to quote more. To fully appreciate the thoroughness with which the subject is treated, the book itself should be read.

There is however one more point we should like to allude to, namely what the French call "Irregular outposts." There is nothing laid down in our Drill book as to how a force is to act when it reaches its ground too late to throw out its outposts systematically. Here however it is clearly explained that in such a case, the advanced guard is to establish itself as a reserve to the outposts, and to detach in front along the different roads and approaches, parties more or less strong, more or less numerous according to the eminence of the danger. These parties are to occupy the spots which appear the most favourable, and to surround themselves with sentries.

We trust what we have above written will bring clearly into relief two important points, namely the systematic method on which the French soldier is instructed, and the minuteness of the instruction in matters of detail. With us unfortunately there is no system, and what we wish to express in our regulations is too often lost in a sea of ambiguous generalizations which only serve to perplex and mystify the mind of an untrained and inexperienced soldier. General principles are all very well for educated men, but for others you must have constant practice and detailed instructions.

PART II.

In Part I. we reviewed only the portions of the manual which treat of the instruction of troops in the duties of outposts. What remains to be dealt with is none the less important, and shews by the care and minuteness with which all details have been handled, that the French Ministry of War has spared no pains in compiling a manual which should serve as a guide to all ranks under the varying and various conditions of war, and which should definitely prescribe a system

of instruction calculated to secure for the army the highest attainable degree of efficiency.

Part II. "Le service de marche, a subject which we dispose of in about a dozen pages in our Field Exercise, is deemed worthy of the most ample treatment by the French, and the movement of every description of troops from a section of Infantry to a division of all arms is fully and concisely laid down.

It begins as in Part I. by detailing how the training of troops is to be carried out, first the section, then the company, then the battalion. As in outpost duties, so in this, each successive stage is marked by a graduated scale of exercises. Thus the section first executes route marching in face of a skeleton enemy, then two sections are opposed to one another, and finally the same exercises are carried out by night. The manner in which a squad of recruits receives its first lesson in route marching is well worth translating word for word, as each sentence serves to show how lamentably deficient is our own slipshod system of training therein.

"The Instructor divides the old soldiers at his disposal in two groups, one to represent the enemy the other to illustrate to the recruits how a body of soldiers should march.

"The detachment representing the enemy goes on in advance to occupy some specified position; the instructor then marches off the remainder, after warning them that the enemy is in the direction which they are following, and that an attack may be expected at any moment.

"According to the orders received, the Non-Commissioned Officer commanding the enemy sends a patrol to observe the march of the section, or posts his detachment to attack it. The discovery of this patrol or detachment, as the case may be, gives the Instructor an opportunity of impressing on the recruits the necessity of taking precautions when on the march, in the neighbourhood of an enemy. He shows them how accordingly one can protect troops on the march by means of Advance Guards, Rear Guards and flanking parties. He then tells off a squad of old soldiers under a Corporal to form the Advance Guard. This squad throws out feelers in front and also on the flanks if the ground permits. Two other old soldiers are told off to form the Rear Guard. The section in this formation resumes its march.

"Meanwhile, according to the orders given, the enemy has made new dispositions, it has for example placed a patrol near the road; this patrol falls back as soon as it is perceived by the leading files of the Advance Guard, which at once sends back a man to apprise the commander. The Officer halts the section in order that the recruit may hear this report; he interrogates the man in such a way as to

" make him give explicitly and clearly the news which he brings. The march is then continued.

" Further on, the enemy may be directed to attack the Advance Guard or one of the Flanking parties, and force it to fall back on the main body; the section is thus compelled to take up a position. In these exercises, sham fights are not permitted, as soon as the enemy, which is inferior in force, arrives within effective range of the main body, it ought to retire.

" As opportunities occur the Instructor defines the various terms in use, such as Advance Guard, flanking parties etc. He explains how the leading files (*"la pointe"*) may send back a report by one of the men, whilst the others continue to watch, and shows how connection is maintained between them and the Advance Guard.

" When the Van Guard* reaches a turning which would cause it to be lost sight of, it leaves a man behind. The Instructor points this out and explains the reason. At cross-roads the Instructor points out how the flanking parties move off to reconnoitre such roads for a certain distance.

" Whenever the Van Guard or the flanking parties meet with any obstacle, or arrive before a height or a defile the Instructor observes the same course, he halts the party to explain what ought to be done by one and all, and only resumes the march after having pointed out the mistakes committed.."

" When the Van Guard reaches the entrance to a wood, it is regularly reconnoitred so that the men may learn what ought to be done in such circumstances."

" If it be of some extent, the Instructor explains that it is necessary to send patrols to explore it for a certain distance on both sides of the road and for this purpose patrols of three men are sent out."

" At a village the same process is carried out. The Instructor explains that the first object is to reconnoitre the court house, the church, the station, the Post Office, etc., places where the enemy will most likely be found if the village is occupied.

" He ends this part of the lesson by directing the enemy to send some men to represent civilians coming towards the column. The Van Guard stops them and the corporal in charge sends them on to the Commander of the Advance Guard who questions them on the localities and the nature of the road beyond."

On the march back, which if possible is made by another road,

*The French term "*La Pointe*" will be rendered throughout by the word Van-Guard, the term Advance Guard being restricted to the main body of the Advance Guard.

the Instructor forms up the detachment as a Rear Guard. He impresses on the recruits the object of the dispositions taken, and explains that the Rear Guard has to confine its attention to the rear and not to the direction in which it is going. When this first lesson is concluded, it is repeated but without halting the section for the purpose of giving explanations.

Such is the first lesson in marching that a young French soldier receives ! contrast it with what happens in our own service.—The Squad is drawn up on the Drill ground. Up comes the Drill Sergeant,—“Attention ! Now men to-day we will do “Advance Guards,—Advance Guards are formed in front of a column for the purpose of covering and concealing the motions of the main body. A company forming the Advance Guard is divided into five parts, one half company will form a support under the Captain, the other move about 200 yards in advance under the right guide. Two files on the right, Quick march—Corporal Atkins take charge of that party. Four files on the right, outwards half turn. Now then you are flanking parties remember, so keep to the side of the road—Quick march.” Thus is the advanced Guard told off ! It marches solemnly out of the barrack square and for half a mile or so down the dusty high road, then back again in the same order but under the designation of “The Rear Guard.” Not a word is said, not a hint is given, but as long as step is kept and arms properly trailed, the drill sergeant and everybody else are perfectly satisfied. The Squad has received its first and last lesson in Advance Guard duties. The next lesson these young lads will get may be in front of the enemy in Zululand, or amongst the defiles of the Afghan passes.

The first lesson acquired, the young French conscript’s education is by no means finished, in the section, in the company, and in the battalion he has still many exercises to perform, but as the method pursued is much what we have already described, we will pass on to the general instructions for marches, from which we may derive many valuable hints.

These general instructions contain directions on every detail connected with the movement of troops, from Rendezvous to Retreats, but space will only permit us to make a few extracts.

“In order to facilitate the march, to prevent spasmodic marching, marking time, stepping out etc., it is advisable to leave a distance of 10 paces or so between each company.”

We have ourselves seen this system tried and found it attended with the best results. It gave the men room to open out without checking the march of the column, and it allowed a certain amount of air to circulate freely between the different companies.

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“Bugle sounds should be rarely used during the march. However

"a bugler should always be left at the tail of the column under the orders of the commander of the last subdivision whatever it may be, for the purpose of sounding whenever it cannot keep up or when the difficulties of the road cause an excessive lengthening out of the column."

Had this rule been observed, what worry and trouble would have been saved on many a night march during the late campaign in the Khyber hills. In the flank march round Rhotas and in the Bazar valley we remember how often all connection was lost, and how the word was being constantly passed along for a bugler, when no bugler could be found. On one occasion a company in rear had so hopelessly lost itself that the officer in command directed shots to be fired, an expedient which enlightened no one, and alarmed every body. * * * *

"A halt should be made about three quarters of an hour after "marching off" This is a custom we seldom observe in our service, but of its wisdom there can be no manner of doubt. It is after the first two or three miles that men most require to fall out for purposes of nature, and it gives the men an opportunity of comfortably adjusting their accoutrements, which often have been hurriedly and carelessly put on just before starting. * * *

"Halts of five minutes should be made every hour."

Such a regulation no doubt lessens the inclination of men to fall out, the knowledge that there will soon be a halt urges them on, and besides gives men the opportunity of easing themselves at frequent intervals. Without such halts a man who falls out for such a purpose, has to give some other man the bother of carrying his rifle, and in order to rejoin his company has himself to double after the column for half a mile or more. . . .

"At the bugle sound 'Halt' when the column is of any size, every subdivision should close up. The Bugler at the tail repeats the 'Halt,' when the last subdivision has closed up and halted." . . .

"In night marches, intervals should be diminished, halts more frequent, and the pace diminished."

The army of the Khyber at all events would have profited had such measures been observed on more than one occasion. . . .

"Night marches should be avoided as much as possible; the results they procure are rarely worth the fatigue they cause the troops."

The truth of this maxim has been conclusively proved on many a weary march, when after stumbling along for hours over rocks and through ravines, it has been found, that only a few short miles have

been traversed. The first expedition to the Bazar valley is a notable instance.

"It (the Vanguard) always remains in communication with the head of the Advance Guard. For this purpose the commander of the Van Guard leaves a man behind whenever he arrives at a bye road, a turning or the summit of a hill, which might cause him to lose sight of the body of troops behind."

This may be sometimes done in our service, but not being enjoined by regulation, is more often left undone.

"In a hostile country or one over-run by the enemy's troops, the Advance Guard should always assure itself before passing over a bridge that it has in no way been tampered with."

In these days of electricity and dynamite such precautions are doubly necessary, or we may live to see some grave disaster, the result of neglecting them.

"When obstacles are encountered by the Van Guard, the Commander of the Advance Guard should always be informed of the delay likely to result therefrom."

The observance of this rule is in the highest degree essential to the good order and regularity of the march. Without it the troops in rear press onwards, and the various sections of the advance Guard cease to retain the intervals which are deemed necessary to the safety of the column. Moreover suitable opportunities for halting are thrown away.

"The Commander of the Advance Guard should be careful to re-inforce the Van Guard whenever it becomes unduly weakened by the detachment of Flanking Parties and Patrols sent off to examine distant ground."

"In certain cases for example when there are no lateral roads, or when it is necessary for the safety of the column, the flanking parties take position on all commanding points to the right and left, and remain in those positions while the main body defiles past. They profit by the first halt to regain their places in the line of march."

Such in our opinion is the only way of moving through a defile like the Khyber. Over ground so rugged it is impossible for flanking parties to keep place with the troops moving through the defile, and it is only by detaching parties from the head of the column to occupy each successive point of vantage, that the unimpeded march of the remainder of a long straggling column can be ensured.

But it is not only in the general tenor of its observations that this part of the manual excels others of a like nature but in the minuteness with which it enters into details. It lays down approximately the strength and formation of Advance Guards for any given force, and it describes minutely how each part thereof from the leading files of the Van Guard to the main body itself should act under different circumstances. In the whole range of military literature we have never met with any thing so *'thorough'* and complete. The much lauded German "Regulations for training of troops for service in the Field" are admirable in their way but in our opinion cannot compare with these Instructions as a means of imparting knowledge to all ranks.

PART III. RECONNAISSANCES.

Reconnaissances from a French point of view are classified under four heads

- | | |
|-----------------------------|-------------------------------|
| 1. Patrols. | 3. Special Reconnaissances. |
| 2. Ordinary Reconnaissances | 4. Offensive Reconnaissances. |

But as the subject of Patrols is so intimately bound up with that of outposts and marches, and as special and offensive Reconnaissances are matters appertaining rather to the Staff of the army, Part III deals only with the subject of "*Ordinary Reconnaissances*." It lays down clearly how the training of troops in this important matter may be carried out. Shows how it may be blended under certain conditions with instruction in Outpost duties and Route marching. Notes the details to be observed concerning roads, railways, watercourses, canals, embankments, defiles, woods, heights, plains, inhabited places etc. Describes how a reconnoitring party should act on encountering the enemy. And prescribes the form to be used in making reports. In fact it treats in a brief and concise form of all those subjects which may be embraced in the term reconnaissance, the knowledge of which is indispensable to the Officer or Non-Commissioned Officer conducting such an operation. It will be unnecessary to enter more fully into the treatment of this subject, but we would like to comment on certain paragraphs particularly deserving of attention. Talking of questioning the inhabitants of a hostile country, the writer says:—"The Commander of a reconnaissance questions all he may meet on the road, in villages he interrogates not only the chief of the municipality, and other local authorities, but also *young people and children* who being less on their guard are more disposed to repeat what they have heard or seen." Possibly this course may be recommended elsewhere, but we never remember having seen the suggestion before, and certainly on the principle that in the mouths of babes and sucklings there is no guile, the device is one likely to be effective.

"The Commander should not seek opportunities of fighting; his duty is to collect and give information. *He must never sacrifice this,*

" the object of his mission, to the desire to signalize himself."

These are words which should be impressed on the Commander of every reconnaissance. How often are the intentions of a general defeated by the wilful impetuosity of his subordinates and their immoderate desire to acquire glory.

" If obliged to retreat he should send back mounted orderlies to " apprise those in rear, and if necessary should announce his retreat " and the advance of the enemy, by the burning of some shed or haystack." This is a measure of precaution which might not occur to every man, but which by the timely notice it would afford, might be the means of saving an army from disaster. Had some such signal been arranged between Lord Chelmsford and Colonel Durnford, we might never have heard of the massacre at Isandlana.

PART IV.—CANTONMENTS AND BIVOUACS.

This section deals with a subject which in its way is just as important to all ranks as a knowledge of the more interesting details of outposts and marching, but which either accidentally or for some occult reason has never been broached in our red-books.

While admitting the difficulties attending the billeting of troops in times of peace, it is pointed out that there are many details that can be practised such as the duties devolving on officers and non-commissioned officers, the distribution of quarters, the appointment of rendezvous and places of assembly, guard and police duties, and many others which will in no wise interfere with the occupations of the civil population.

Bivouacking on the other hand, presents no difficulties and its practice by companies, battalions and regiments is strictly enjoined.

By the word "cantonments" the French understand not our word "cantonments" but billeting pure and simple, so where henceforth the word cantonments is employed, the latter and not the former interpretation must be given it. When troops are in tents or barracks the word camp is resorted to. The term bivouac is applied to troops using the "*tente d'abri*" as well as to those without shelter of any kind. By the term "*campement*," an untranslatable word, is understood those persons collectively to whom is entrusted the preparation of a cantonment, bivouac or camp. For a battalion the *campement* is composed of the Adjutant, one Serjeant and four men per company. Cantonments again, are of two kinds, *ordinary* and *contracted*, the latter form to be adopted when near the enemy, or when circumstances oblige concentration. In the former case the space is allotted at the rate of two to six men for each fire place, in the latter the only consideration is space for lying down under shelter. The manner in which the distribution of billets is effected, the duties to be performed, the formation of Bivouacs in line or column, are all carefully laid down,

so that no manner of doubt can exist, on the course to be pursued and the routine to be observed under different circumstances.

A few extracts will suffice to illustrate the manner in which the subject is dealt with, and to close the chapter.

“ Officers should not be lodged in the same hotels etc., as the men.”

“ Rendezvous should be fixed on for each company, so that the men may assemble in organized bodies, with the utmost celerity on the alarm being given, even by night.”

“ To facilitate the assembly of troops and to protect them as much as possible from foul play on the part of the inhabitants, soldiers are for preference quartered on the ground floor.”

“ In an enemy's country the inhabitants are compelled to retire to their houses at 'retreat', after which no one is permitted out.”

“ In case of the alarm sounding, the inhabitants are instructed to remain in their houses, and to shut the doors and windows while leaving the shutters open. By night the windows should be lighted up.”

PART V.

Convoys and the lesser operations of War.

Instruction in these matters is generally imparted through the medium of the section and the company. As regards convoys, surprises, and ambuscades, the Captain confines himself to indicating when out route marching, or doing reconnaissance, the favorable points for operations of such a nature. Later on he actually executes them by dividing his company into two parts and charging one with the offensive, the other the defensive. He himself gives the general idea, and acts as umpire. The same exercises may be repeated by two companies opposed to one another, or by two half battalions.

Instruction in the destruction of railways and railway gear may be given in communication with the railway authorities who should always be consulted as to time and place.

The chapter on convoys gives many useful practical hints some of which we extract. “ If it is a powder convoy, the escort ought to be more numerous, to enable it to offer fight if necessary at some little distance from the convoy.”

“ The commander of the convoy should on the eve of departure,

"collect all his wagons and park them as if en route."

"From time to time, halts of a few minutes should be made to let the animals regain breath, and to give the last carriages time to close up."

"At night the convoy should be parked so as to provide against surprise, and for preference, if the country is hostile or badly disposed at a distance from inhabited places."

"The Commander should not halt and park in the presence of the enemy, unless he is certain that the enemy's forces are much superior to his own. In that case, the carriages and wagons form double rank, if not already in that order, and form up perpendicularly to the road, the shafts inwards, the horses facing each other."

"When after a stubborn defence, and the loss of the greater part of his escort, the Commandant feels unable to offer further resistance, and sees no chance of succour, he should set fire to the convoy, and then endeavour to cut his way out, while carrying off his animals. He should kill these latter rather than abandon them to the enemy."

"All conversation between prisoners on the one hand, and the escort or inhabitants of the country on the other is forbidden. On marching off, the escort loads its arms in the presence of the prisoners."

"If the convoy is attacked, the prisoners are ordered to lie down, a part of the escort remaining near them, to fire on any who should rise without orders."

We are aware that many of the above quotations may be found in almost every work on the art of war, but they are not to be found in any book with which the soldier is usually acquainted.

The second chapter of Part V. deals with the subject of requisitions. It is not often that British troops have to resort to such measures except through the Commissariat, still it is just as well that every subaltern and sergeant should know how to act in case such duties should devolve upon him.

The next chapter treats of surprises, ambuscades etc. and scarcely calls for comment, there is however one sentence which should be kept in mind by all officers commanding when engaged in such affairs. It is "that the line of retreat, the signal for, and the point to rally on, should be indicated before-hand to every man of the detachment."

The last chapter, that on the demolition of railways, telegraph lines, bridges, material of war etc., conveys in a few pages a vast amount of technical information as to the most efficacious and rapid manner of accomplishing one's object. Most men can destroy in a clumsy, desultory

fashion, but few officers and fewer soldiers are aware how they can best accomplish the end they have in view with the least amount of trouble, whereas, rapidity and completeness of execution are most essential in all such operations.

Having now described to the best of our ability the contents of the "Instruction Pratique," it only remains for us to point out what lessons may be gathered therefrom, and in what points we should do well to follow the example of our neighbours.

Firstly it seems to us that a great want in our service is a recognized system of instruction in outposts and marching. It is not all men that have both the ability and the moral courage to strike out a line for themselves, and depart from the ordinary routine of the service, and few Commanding Officers will do so unless they have both precedent and authority for their acts.

If progressive and gradual training is required for the goose-step and bayonet exercise, how much more is it necessary for Outpost duties and Advance Guards. We consider instruction "by numbers" necessary in the one case, why not in the other. Every man is no more a born scout than he is a born marksman, and therefore if he is to become proficient as a scout he must be regularly trained. But he never will be, except in a few rare cases, unless a recognized system of instruction is laid down by authority.

Secondly we omit altogether the training of men in the subjects enumerated in Parts III. IV and V. It may be deemed unnecessary that the rank and file should be trained in these subjects but we submit that it would be altogether for the advantage of the service, if at all events the Non-Commissioned ranks received a certain degree of instruction. Casualties on service may often result in a party out reconnoitring or on requisition duty, in ambuscade or on convoy duty, being left in command of a Non-Commissioned Officer, and if that Non-Commissioned Officer be totally untrained how can it be expected that he will act with circumspection and decision.

Thirdly we require such a Manual as the one reviewed to place in the hands of every soldier. A cheap book published by authority is much more likely to be read than any other, and moreover it, and it alone, will be accepted as gospel by the Non-commissioned Officers and Rank and File of the army, to whom a Boguslauski or Verdy du Vernois are as mystical as Confucius or Menu, and a Home is but a false prophet like unto Mahomet. Again such a Manual would offer in a concentrated form all the information which is now only to be culled from half a dozen different works.

In conclusion we cannot do better than advise, any officer who wishes to obtain a few valuable hints on the conduct of Infantry under the various circumstances in which it may be placed to write to M. Paul Dupont 41 Rue Jean-Jacques Rousseau, Paris for "L'Instruction Pratique, sur le service de l'Infanterie en campagne" price 75 centimes.

E. G. B.

III.

PROPOSED NEW METHOD OF BREEDING HORSES IN
INDIA FOR MILITARY PURPOSES.BY LT.-COL W. TWEEDIE, *Political Agent.*

HORSES are in their nature wild things of the plain, like deer, camels, or elephants; graminivorous, not granivorous; and shunning, not seeking the neighbourhood of human habitations.

To capture and utilize them is one of man's numerous triumphs over the rest of the creation. To cause them to breed and multiply in paddocks and stables, instead of in their native solitudes, is a conquest more remarkable still, however common-place it may now seem.

But just as certain limits have been set by Nature beyond which her handiworks cannot possibly be altered, so have certain laws been prescribed the recognition of which is of essential importance in all our intromissions with her creatures.

In general terms it may be said (1) that the less dissimilar from the original type the development of it which it is desired to produce, the more closely should the natural conditions concerned in the production of the former be imitated in our attempts to arrive at the latter: and (2) the more congenial to the natural constitution, or habit, of such type the climatic and other conditions under which the attempt to improve it is made, the more satisfactory will be the results obtained.

Thus one set of conditions will conduce to the development of an equine variety capable of winning a Turf-prize at two years old; and another, and wholly different, set of conditions to that of a breed adapted for the requirements of the traveller and soldier: while just as surely will it prove easier to breed, say Shetland ponies on the adjacent mainland of Scotland than in the south of England; or Arabian horses in the dry and hot portions of India than among the fens and fogs of Lincolnshire.

On the two principles just noted, the scheme of horse-breeding to be presently brought forward, will be found very much to rest. Hence the plainness with which they are stated at the outset.

Neither the period nor the country to which the first subjugation of the Horse belongs can be clearly ascertained. There is no reason for supposing him indigenous to the East, any more than to the West; while as regards the locality in which he has undoubtedly attained his highest form of *natural* excellence, namely Arabia, he seems to have been little known there before the time of Muhammad; in one of whose expeditions we read of only two horses, in an encampment of ten thousand men; and of camels, sheep, silver, and human captives, but no horses, having been carried off by him as plunder.

It is certain, however, that the Horse must have attained great symmetry of form, as well as great swiftness and power of endurance, in Arabia and Syria soon after his introduction. The hot and arid climate proved eminently suited to his natural habit. Moreover, the *Bedouin* tribes, whose very existence was bound up with his, shared to the full his own natural aversion to confinement. Rarely approaching, and never entering a town or village, their predatory lives, rapid marches, and frequent privations were of all possible conditions those best fitted to make him what he still is, the Horse *par excellence* of travellers and soldiers. If the development of the Arabian had depended on crossing him with foreign blood, close stabling, veterinary colleges, or turf-clubs, he would never have been developed at all. There are no stables, no horse-races, and very little corn, in the desert; while as for foreign blood, if a Buccaneer or Blair Athol were to travel all over the Haurân not a mare would ever be sent to him by the *Bedouin*. Rigid adherence generation after generation to his own indigenous and approved strains of blood forms one of the few 'innate ideas' of the desert horse-breeder. And the result is the production of an animal complete in himself *teres atque rotundus*—not a mixture, or thing of shreds and patches; but a veritable master-piece from Nature's own work-shop; whose qualities, having all been transmitted to him through lines of uncrossed progenitors, are nearly certain to re-appear in his descendants.

How different the history of the Horse in England. What the indigenous equine races of our islands would have been at this day if they had never been crossed with Eastern blood may be gathered from old pictures; or from a glance at the numerous animals still to be met with, especially in Ireland, into whose veins no stud-book blood has ever found its way. In grafting upon the primitive English stem, cuttings brought from an Eastern clime, our breeders, instead of being favoured by the hot and dry atmosphere proper to the latter, have had to contend against the cold and damp one which forms the *habitat* of the former. With the help of stables which are simply hot-houses, and a science of horse-management which it has taken many generations of learned Veterinarians, profound trainers, and sapient grooms to elaborate, the graft has doubtless been brought to admirable maturity, in the form of that highly artificial production so well described by the late Admiral Rous as "the Anglo-Arabian." In the contests of speed which form at once his *raison d'être* and the objects towards which all his qualities

converge, this Anglo-Arabian confessedly stands unrivalled. The best hunters, carriage horses, and pleasure-hacks in the world also spring from his loins, that is, in England itself and a few other countries, where all the multifarious appliances concerned in his development are available, as far as necessary, for his stock. But in estimating his value for the purpose of begetting, in this eastern climate, a hardy breed adapted to carry our cavalry to Kàbul or St. Petersburg, it should not be forgotten that the basis of his excellence is that eastern blood which it is as easy to procure in its original and undiluted form : and which can scarcely have derived any new or additional virtue for military purposes through having been stabled and pampered, physicked and enervated for a certain number of generations in the foreign and uncongenial climate of England.

In connection with the indigenous equine breeds of India, the first thing to be noted is that India itself consists not of one, but of numerous diverse countries ; each with its own natural conditions, and its own special influences on animal and vegetable life. The same is of course true of all other divisions of the earth's surface : and even within the comparatively small compass of Arabia itself the Horse varies a good deal in different localities ; improving in quality, and increasing in numbers, towards the inland and central parts—a fact recognised by the Arab saying that the "mountain bred horse is better than the plain bred one : " and that one bred in a marshy place is fit only to "carry a pack." Moreover, in India at all events, a very small degree of geographical separation sometimes serves to produce a remarkable difference in the qualities of the horses yielded by two districts respectively. Thus the horse of Lower Bengal, for instance, is greatly inferior to his near neighbour of Bahàr or Tìrhùt : and is scarcely indeed to be matched, in point of degeneracy of form and quality, anywhere in India : or anywhere at all, perhaps ; unless it be in some of the districts of South America lying close under the southern tropic ; where the steamy moisture of the air, hazy horizon, and superabundant vegetation, not less than the marked physical inferiority at once of man and horse, are all suggestive of the Hughli valley.

Another fact requiring to be prominently stated is, that India is not in these days naturally a horse-producing country. Had its "upper middle" classes loved the saddle and coach-box, as much as they do their palanquins and bullock-carriages, and the agricultural population used horses, and not horned cattle, in their ploughs and carts, then perhaps, when the sword began to be beaten into the ploughshare, and the spear into the pruning-hook, under the pacific influences of British rule, the horse of Pindàri and Marhatta would merely at the same time have passed into hunter and hack, carriage-horse and plough-horse, as was the case in England ; instead of dwindling almost to nothing, as has actually occurred. Horse-breeding would then have held its own

against the spread of cotton and high-farming: and the pastures watered by the Bhilma and the Mānjra—not to mention Kātiawār and Kach—might now have been to the rest of India what Yorkshire is to the rest of England. For a time, it is true, the scattered followers of Bāji Rāo, Chitū, and Amīr Khan and their descendants after them, kept up the good old breeds, to meet the demand for them which survived for a certain number of years, especially in native states. Up to 1837, the regiments of Nizam's Cavalry now forming part of the Hyderabad Contingent were mounted entirely on Deccan horses; but this has long ago ceased to be the case: and even in the mounted branches of the Nizam's own 'Reformed Troops,' Arabs, or Walers, are the rule, and Deccanis the exception. And yet the horse of the country cannot have been superseded in this way owing to any other cause than the failure of the supply; for Col. H. Shakespear—himself an old officer of the Nizam's cavalry—mentions in his well-known book on the 'Wild-sports of India' that he has seen both Arab and Deccani work; and that the latter "*proved quite as capable of long marching as the Arab or any other horse in the world*"—a testimony conclusively establishing that there is nothing in the mere climate of certain parts of India unfavourable to the development of equine excellence.

Writers on this subject have freely blamed Government for having, as the phrase goes, 'ruined the breeders,' by setting up studs of its own; as well as by sending to the Cape and Australia for remounts. But it would have been as idle to look for the continued production of the old stamp of native horse in the new times as to suppose that the Arabian himself would retain his present characteristics for any very great number of years if his native wilds were to be made over to us like Cyprus. Nature still holds sway throughout large portions of Arabia. But it is needless to remark how completely her 'ancient solitary reign' has been disturbed in this country, and its essential features altered, through the spread of cultivation, the increase of population, the depression of certain classes, and the operations of the revenue surveyor and railway engineer, which have followed in our train.

Even in native states—those last refuges of primitive manners—the same or similar influences have more or less prevailed: and the young Pathan or Marhatta of to-day whose father thought only of how far his favourite horse could carry him at a stretch, when he buys a country bred-horse at all, and not an Arab, looks out merely for one that will make a brave show in a city procession: and grow to an enormous size if shut up as a colt in a dark stable, and fed on mashed grain and clarified butter. Horses of this kind are still appreciated by certain classes of natives: and absurd prices are often paid for them: though no one ever thinks of them in connection with military purposes proper, or hardwork. In their own way indeed, they are almost as artificial productions as the Anglo-Arabian himself; and furnish one other illustration of the aptitude implanted in the equine species for

assuming abnormal, or even monstrous forms, when subjected to special modes of rearing, with special objects in view.

Does it then come to this, that India, since no longer yielding as it were spontaneously a supply of horses suited for military purposes, must be content to obtain its remounts from other countries ?

Not necessarily.

Many a region naturally devoid of certain products has yet taken kindly to such products, and brought them to vigorous maturity, on their being transplanted to it from their own proper *habitat*: and it seems not improbable that the Arabian horse, if transplanted to suitable districts of India, and reared more or less in conformity with the natural conditions of the equine species, would strike root in the new soil ; and establish there a breed resembling the original type ; just as the English horse and dog have done in Canada and Australia. If India had been more of a colony, and less of a mere military position, relatively to our own country, than it necessarily is, then an experiment of this kind would in all likelihood have been made long before now, by means of the same European enterprise and capital which have spread, for example, the half-Moorish merino sheep of Spain over Europe, as well as over England and Australia. But the monied natives of this country have other ways than horse-breeding of investing, or increasing their wealth ; while our own communities again can scarcely be expected to embark in undertakings of this nature. Government itself therefore can alone do what is necessary, and alone command success, if success is to be commanded at all.

The introduction of the English horse and dog to certain of our colonies was referred to just now as exemplifying successful transplantation, in preference to numerous similar instances that might have been named ; because a difference has to be recognised between transplantation having for its object the mere production in the new locality of hide, milk, flesh, or perhaps even wool, on the one hand ; and transplantation for the success of which the continued development of all an animal's pristine powers and qualities is essential on the other. If, for example, the English horse had had to be bred in India wholly for the sake of his hide or hair, as the African ostrich is reared in the south of France merely for that of its plumage, then it would not have mattered how widely the conditions of his new life had differed from those of the old or from those prescribed for him by nature ; and he would probably have done just as well in a Bengal farmer's shed, or a small enclosure on the banks of the Ganges, as in any other kind of location. In a lesser degree, the same reasoning may be applied indeed to mere breeding for the turf. Here the one object is the development at the earliest possible age of the highest obtainable racing power : and who can doubt that if some new regimen were to be discovered more productive than even of this particular virtue, it would be eagerly resorted to ; no matter what violence might be done by it to the natural habit

of the Horse; or how little conducive it might be to the improvement of his powers generally. Very possibly we may have lost many a point now and then as horse-breeders, through applying to establishments designed for the production of remounts too much of the system proper to breeding for the turf. But however this may be, it seems certain that, where only the former object is concerned, the Laws of Nature, and not the precepts or traditions of Doncaster or Middle Park, form the true compass to steer by.

It is now however time to indicate where and how the Arabians required for transplantation should be procured: how they should be dealt with, after reaching this country; and on what principles the produce should be reared.

1.—THE PARENT STOCK.

After all that has been urged above, it is hardly necessary to repeat that this should be wholly Arabian. Not only is purity of blood, or fixity of race, a grand point to start from: but when it is considered that the cavalry, if not even the artillery trooper also, should be a saddle-horse pure and simple, not half-saddle horse half-racer, it is hard to see what advantage any one could propose to himself in crossing the strain of perhaps the only pure saddle-horse in the world, that is the Arabian, with admixtures derived from other sources. If increased size* is wanted, far better develope it gradually through the influences of climate, food, and care; than arrive at it suddenly by means of crossing.

To obtain the requisite stock in India itself would clearly not be possible. Arab mares, as is well known, seldom find their way here at all: and it far from follows that because a certain Arab horse has won races he is necessarily of lineage making him eligible for the stud. Horses of pure blood have been imported indeed through private channels, and regardless of expense, by men like H. H. Agha Khan and the late Muhammad Bâkir, to contend for the great prizes of the Western India turf. But only a certain proportion of those have shown speed: just as in England, of two thoroughbred colts—own brothers perhaps—one may turn out an Eclipse, and the other never be any faster than a hack. Of celebrated racing Arabs, many have merely been what the Bedouins call 'sons of horses,' not horses, that is, got by some pure-bred sire out of a comparatively inferior mare. The way to

* The rage for giants as cavalry soldiers seems spreading even in this country: the equestrian classes of which, as a rule, are of the light and wiry, not the ponderous order. Tall men are thought to require tall horses; and it may even be that the native cavalry branch is suffering in consequence, that is, from a real service point of view. But even as regards big heavy men, let any one who doubts the powers of the Arabian, refer to the regimental records of Her Majesty's 17th Lancers; and ascertain how well their little Arabs carried the men through the mutiny campaign.

reproduce animals of this stamp is to breed, not from themselves, but from their parents. Nevertheless it is certain that many of the Arabs sent to the Indian studs have been—even when blood-horses and good runners—such as the Bedouins themselves would not have bred from. Considering that agents of foreign governments and others, frequently pay from £ 200 to £500 for likely colts of pure blood, among the black tents of the Bedouins themselves, and into the breeders own hands, no further proof is needed that animals of the same class can never find their way through the ordinary trade channels into the Bombay stables, excepting now and then by accident: seeing that the suppliers of the Indian market are not producers at all, far less of course *Bedouin*, but mere middlemen or hucksters, who pick up what colts they can between Baghdad and the Persian Gulf, and bring, or send, them to Bombay, to be sold for what they will fetch. "*There is blood and stride in the desert which has never been seen out of it,*" wrote Mr. Skene, our Consul at Aleppo, in a letter to a friend, which was published in the "English Sporting Review" for March 1864. No doubt this must be taken *cum grano*; especially as affecting countries whose rulers have spared no efforts to secure specimens of the best desert strains. But as regards this country, to which Mr. Skene referred when he wrote, it is clear from what has just been explained, that notwithstanding numerous exceptions which have occurred, the assertion just quoted may be received as substantially correct: no matter what the Arab horse-dealers of Bombay and Calcutta not unnaturally maintain to the contrary.

The only way therefore for the Indian Government to obtain Arabs fully suited for breeding purposes is to send for them to the fountain-head. One or at most two stallions, and about fifty mares, would be as many as should be imported for the sake of a first experiment. These could all be procured by a competent officer; who should reach Damascus in April; and afterwards work his way, by Aleppo and Baghdad, to the Persian Gulf; buying as he went: the summer and autumn months being those in which most of the horse-breeding tribes of Bedouins spread themselves over Syria. The officer intrusted with this duty should not only be an excellent judge of the Arab horse, but, above all, well versed in the art of dealing with uncivilized people. No one can tell merely by looking at a horse whether his pedigree is perfect or doubtful: and Arabia has no stud-book. On the other hand, however, the descent of every celebrated desert horse is as safe in the oral keeping of the tribe as that of our own county-families in their parish registers. The most suitable *aide* that could be given to the purchasing agent would be a native cavalry officer: a (*Sunni*) Muhammadan of course; and a man of tact and experience; by whose means the confidence of the Bedouin might be won. A Veterinary Surgeon would also be useful.

It is a mistake to suppose that the Bedouin refuse to sell their mares. A buyer possessed of the necessary qualifications, and able to

rough it, would be puzzled by the numbers that would be shown to him during his peregrinations; rather than hampered by any difficulty experienced in meeting with what he wanted: and might reckon on making up his number long before reaching Basra, at prices averaging say £100 a head. It is not meant that mares of Arabia's bluest blood would fall within this modest limit: but such are not required for the present purpose. Enough if they really came of approved Bedouin strains, and not from the villages of the Fellâhin, or stationary and agricultural Arabs; were free from all congenital unsoundnesses, or faulty points of conformation, likely to reappear and lead to mischief in their stock: and were as much as possible what one would choose in buying a weight carrying charger or hunter.

As regards the sire again, neither labour nor money should be spared in securing the very best in every respect that was to be found. Some few years ago, Abbas Pasha of Egypt paid through his agent in the desert about £800 for one Arab horse: and no stallion of the highest stamp is to be had from the Bedouin for much less than say one-third of that extreme and probably 'fancy' price. Unsoundness does not lessen the value of an Arab horse or mare in the owner's eyes: and such is the wear and tear of desert life that even colts and fillies without at least one bent sinew or enlarged joint are not to be met with every day. To a certain extent therefore, allowance would have to be made for unsoundnesses, in buying Arabs for stud purposes: although if by a happy accident a stallion could be found who had stood all the severe work of the desert up to maturity without anything about him giving way, what better evidence than that of true fitness of part to part; and of a constitution free from taint or flaw? Such a horse, if sprung from one of the most esteemed *Anzûh* races, like the *Saglâvi Jadràni*, *Abdiân Shirâk* or *Hamdâni Simri* and of commanding size and figure, might well be considered worth his weight in silver for the purpose now in view.

II.—LOCATION OF THE STOCK IN INDIA.

When the East India Company planted its first breeding studs in Bahâr and Tîrbût, no one had any idea that the empire would extend itself to Peshawar. The costly buildings provided at the outset for the stock may easily indeed have had something to do with fixing those establishments themselves in the original localities, even when more eligible situations had become available. But in these times at all events, we have surely a wide enough stretch of country before us to choose from.

Without entering too much into details, the following points seem to call for note, *viz* :—

1. The more nearly any district resembles central Arabia, in respect of the heat and aridity of its climate; its remoteness from the sea; the nutritiousness of its natural grasses; and

the hardihood of its people; the better fitted ought it to prove for the rearing of horses.

2. Wherever a tradition lingers that good horses were bred in a certain locality in former times, such site should be examined: and if it is found covered with herbage of the right kind; traversed by a stream or streams; presenting, for example, a red soil of moderate depth, on a substratum of gravel; and free from all noxious winds; then it will probably answer: especially if lying high; and the appearance of its flocks, herds, and ponies is favourable. The characteristics of the people themselves also deserve notice; for, as a general rule, no district incapable of producing soldiers will be found favourable to the development of the soldier's horse.

The innate characteristics of the equine species, as glanced at in the opening sentences of this paper, should next be reflected on: more especially as the Arabians will have come from decidedly natural conditions of life; and not from straw-yards or stables. The Horse, it should be remembered, is formed to roam over large tracts of country: not to locate himself, alone or in pairs, in woody coverts, or narrow spaces of any description. With this design has he been fashioned and wrought: witness the litness of his frame; the *élan* of his movements; the prominent position of his eyes: his sonorous voice; and in short every feature that he presents: and the less violence that is done to all these things in assigning to him a more or less artificial *habitat*, the likelier the new race to prove adapted for war.

To turn horses out altogether in a country like India, with its poisonous snakes, mad dogs, ravenous beasts, and dangerous rivers, would certainly not answer: nor is it desirable that animals intended for the closest fellowship with man should be reared, as in Australia, in solitudes where human footstep seldom falls. But is there no middle course, between this on the one hand, and their being 'cribbed, cabined, and confined' in small irrigated paddocks on the other? Yes there is; if the Government of this country will only bestow on its equine stock, spaces one-tenth part the size of those sometimes allotted by private gentlemen in the North of Scotland to their red deer: in other words, if a few square miles of rough land in suitable districts of Central India or the Western Presidency can only be fenced in and the mares and their progeny allowed to dwell there in peace and security.

In the absence of a stream of sweet water flowing naturally through the site chosen, one would have to be led into it from some convenient source: for without good water good horses can never be bred; while if the trees were too numerous, the axe would need to be used, until the hottest winds of summer and the coldest breezes of the mild Indian winter had free course over it. Even the fierce September sun, which,

the natives say, is what gives its inky colour to the Black Buck's back, will only harden and temper horses of pure Eastern blood; whatever effect it might have on stock brought from England or Australia; and the fewer trees therefore the better. It would be a great advantage also if the run included a range of low hills; bare, rugged, flinty, and steep; so that the young animals might learn to pick their steps in difficult places. As the ground is, so will the foot be.

No buildings would be necessary: and no expensive establishments; but only a few selected native officers and men from cavalry regiments, to act as superintendents; with a certain number of enlisted horse-keepers, by way of watchers and helpers; also one or two native farriers, not to administer drugs, which should be forbidden things, but merely to see to the feet; shoe when absolutely indispensable; brand the whole stock; and castrate the colts at the proper age.

These people and their families would all of course be located, in tents or huts, either within or just outside of the inclosure: and by constantly moving about among the mares and their produce, handling and making much of the young things; and even backing them, or putting children on their backs, at the earliest age, would cause them to grow up, just as in Arabia itself, on friendly and familiar terms with man.

The nearest civil or military officer would exercise a general supervision over the undertaking; obtaining the views of the principal veterinary authority of the presidency on doubtful points of management; such as the best age to wean at; whether the stallion should be turned out with the mares, or domiciled separately; whether the mares should be allowed to foal in the open, or taken up a few days beforehand; and so forth. Blind adherence to Nature is by no means insisted on: but only this that her essential principles shall not be set at naught, in a climate where that is quite unnecessary: and that even her slightest lead shall be followed; excepting where deviations are clearly indicated, for the sake of obviating some demonstrated evil, or realizing some evident advantage or improvement.

III.—REARING OF THE YOUNG STOCK.

This resolves itself into a question of (1) work, or exercise; and (2) food. Many would put the food before the work: and the well-known tendency of horses bred in India in modern times to run light in the bone is often referred to in proof of a radical deficiency of phosphates in the soils of this country. But the native horse of thirty years ago grazed over the self-same pasturages as those still here and there to be met with; and it was only when he came to be bred in stables or yards that the bone began to dwindle, and the tendons to be 'tied' below the knee. To this day too, that wonderful little animal, the Deccan pony, very commonly shows, for his size, a pair of perfect forelegs; though subsisting principally on what grass he can obtain on the village com-

mon, in the intervals of hard labour from his early colthood as a carrier of burdens. Indeed if chargers and troop-horses the very counter-part of this same Deccan pony, on an enlarged scale, could be bred by the Government of India, then the great problem would be solved ; and all necessity for importing remounts from Australia removed ; for where is the cavalry officer in all Central or Western India who is not fond of telling of some favourite little horse of this description once owned by him ; which he bought perhaps for forty rupees from some villager—to whom by the way the price obtained for him was nearly all clear profit—and which afterwards carried him through some long march, or during the hardest part of some campaign ; when the pampered chargers were all on the sick-report, owing partly to the failure of their rations, and comforts generally ?

The surface of the spot chosen as a run would of course be clothed with one or more of the nutritious and sweetscented grasses indigenous to the Deccan : which, though growing every autumn to the height of several feet, are never succulent, in the sense at least that irrigated grasses, such as lucerne, are ; but are always more or less dry, as well as juicy ; and are usually indeed converted by the heat of the sun into a kind of hay long before they can be harvested. This excellent natural forage would form the basis of the food-supply : and the extent to which it would have to be supplemented by other materials would depend on the appearance presented at different times by the animals themselves. The superiority from a soldier's point of view of a horse that will keep his condition on grass alone, over one requiring daily feeds of corn would not indeed be lost sight of. And if after a time—supposing the scheme to answer, and the number of runs to be multiplied—arrangements could be made for moving the stock periodically from one inclosure to another ; and leaving each inclosure unoccupied every third or fourth year, while its grass was being burned, and other strengthening treatment applied to its soil ; then, evidently, the value of the mere grass in the system of diet would thereby be much enhanced : while the colts and fillies would derive benefit in other ways from their annual migrations ; and from all they would see and hear on the road. With all this however, a diet of grass alone would probably not be found to answer for any considerable length of time : and care should therefore be taken to have plenty of arable land available near the run ; for the production of approved Indian and other cereals, as well as of irrigated grasses, with or without the application of manure. These crops, when harvested with the corn in the ear, or made into hay in the case of the grasses would form food materials not to be surpassed, and if supplied in moveable racks, would be the means of making the stock take many a gallop to get at them. Such however is the Horse's natural love of grazing, that the barer the surface of the run became, the more laboriously would it be explored, in search of some stray nibble of fresh herbage. Far better this than standing up to the hocks among watery grasses, on irrigated pastures : acquiring at once an insatiable appetite ; an indolent and phlegmatic habit ; and a large over-grown carcase, suppor-

ted on puny limbs and flat hoofs. Abstemiousness and resignation—two words strange to the breeder of English race-horses and hunters but representing for all that qualities of the very highest value whether in man or beast—admit of being strengthened by being called into play; just as there opposites do. And the principle is universally recognized all throughout Eastern countries that no horse which has not hungered and thirsted in his early days will ever be able to do so with impunity in his prime. If any one mistake the purport of these remarks so far as to consider that a system of chronic short commons is here being advocated, it will be a pity; seeing that nothing could be further from the real design. The Australian horse, it is true, is reared in large numbers on grass alone; and often actually improves in condition during a journey of many hundreds of miles: though eating nothing all the time except what he picks up round the bivouac where his master is boiling the tea kettle, or stretched out in sleep. The Bedouin horse also will carry his rider for weeks on end, without tasting corn. But the latter at least is regaled with plenty as often as opportunity serves: and consumes a fair share of barley, dates, and camels' milk in the course of every year. Even so should it be with his stock, when transplanted to this country. Large flocks of milch-goats might easily be kept for the benefit of newly weaned foals and growing yearlings. Fast-days should, however, have their place among the feast-days. The quantity of food supplied should always be apportioned to the amount of exercise taken: and a month or two of low condition now and then, if alternating with periods of the reverse, would prove in the end conducive to the up-building of a hardy and enduring frame.

CONCLUSION.

It is not intended to put forward the scheme thus described as a rival, far less a better, method compared with any other systems of horse breeding now in progress, in the Punjāb or elsewhere. However successful some of these may be proving, there is room in the great empire for any number of fresh efforts directed towards the same object, but laid out perhaps on slightly different lines. It is unnecessary to remark that if so simple and inexpensive a method of rearing horses were found to answer, the addition which would hereby be made to the military strength of the empire would be considerable. The same system might then be extended to the production of mules; from exactly similar Arabian mares, and the large blood-asses of Syria. When next we engage in a great war, the horse-supplying resources even of England and Australia will perhaps not be found inexhaustible: and in the case of horses and mules, especially the latter, brought from strange countries there is great difficulty in obtaining men accustomed to them, as drivers and keepers.

Supposing it decided that such an experiment should be made, the sooner the requisite extent of land was taken up the better. An earthen wall, tiled at the top, would be the best means of enclosing it:

and would form a good 'reliefwork' when such was in demand. But if this should prove too expensive, then seeds of the *Acasia modesta*, *Cesalpinia sepiaria*, or some similar shrub, should at once be put down along the boundary line; so that an impenetrable natural fence might be coming up all the time the officer intrusted with the buying of the stock was away on his mission; that is, from about April to November. If a proper hedge had not grown before his return, then the mares would have to be hobbled, as in Arabia, when turned out. This would do them no harm: but should never be resorted to in the case of their produce; else these might grow up with the same imperfect walk, and tendency to trip, which are among the few faults of the Arabian horse; and are partly due to the iron shackles with which the Bedouin restrain their stock, as well as in some degree also no doubt to the very loose style of riding practised by the desert horseman; who seldom uses a bit, but guides the animal under him merely with a halter.

Of numerous other sites for a first experiment which might be indicated, reference may be made to a certain elevated and undulating tract, situated partly in H. H. the Nizam's country, and partly in the Bombay district of Kândès, which was pointed out many years ago by no less an authority than the late Sir James Outram as the best horse-breeding ground he had met with anywhere in India. Lord Strathnairn also, it is believed, when in command of the Indian army, fixed his eye on the same locality, or its vicinity, in connection with a proposed sanitarium for European soldiers: while the site chosen by Sir G. Campbell for his imagined imperial capital of all British India, namely Nasik, is only a few miles off. If the plateau now adverted to were examined, it would probably be found that every natural advantage is there on the side of the horse-breeder: and the allotment of one lakh of rupees only by the Government of India, for the purpose of the experiment now advocated, would not only cover the cost of collecting the stock in the first instance, but go far towards meeting every expense that need be incurred in connection with them during the whole period of say four years which would be required to prove how far successful results were likely to be realised.

GWALIOR,

January 1879.

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IV. HINDU-ISM.

HISTORY OF NATIVE RACES IN THE INDIAN ARMY.

EXTRACT FROM RECORDS IN THE ADJUTANT GENERAL'S OFFICE,

BY MAJOR, NOW LIEUTENANT-COLONEL P. HARRIS,

11th Regiment Native Infantry.

(Continued from No. 31.)

CASTES.

112. According to the traditions of the Hindu religion, confirmed by the writings of their great lawgiver *Menu* (B. C. 800,) *Brahma*, the creator and first deity of the Hindu Triad, is said in the beginning to have created four classes of men :—

- I. Bráhmans—or priests, who emanated from the head of *Brahma*, and were appointed to guide and instruct the rest of the world.
- II. Kshatryas—(Chuttrees) or warriors, who issued from the arms of *Brahma*, and were enjoined to defend and protect the world.
- III. Vaisyas—or merchants, who sprung from the thighs of the god, to nourish and feed the world.
- IV. Sudras—or menials, who came forth from his feet, to wait upon and serve the others.

As has been said before, Hindus of the superior castes in former times intermarried commonly with the inferior castes, thus creating numberless subdivisions of the latter. Indeed *Menu* furnishes elaborate illustrations of the various crosses by which different inferior castes were produced in his day.

These intermarriages however very soon ceased, and were succeeded by absolute exclusiveness. No one hears now of a Bráhman marrying a Vaisya, much less a Sudra ; or of a Kshatrya marrying a

Vaisya, or of a Vaisya marrying a Sudra, or even of one Sudra caste intermarrying with another Sudra caste.

113. For many centuries past the Bráhmans, Ksahtryas, and perhaps some of the Vaisya castes have succeeded in preserving their purity, for all the mongrel or mixed castes became merged in the lower or Sudra castes, leaving the superior ones comparatively pure blooded.

BRAHMANS.

114. The Bráhman occupies the highest rank among the Hindus for several reasons. *First*, his assumed sanctity, for he is the priest of the Hindu religion; he directs the ceremonies performed at sacred temples, rivers and all other hallowed places; he presides over all festivals and performs all religious rites and ceremonies. He casts the horoscope of the new-born child, selects propitious days, gives spiritual counsel, and is at once household god, family priest, and general preceptor and guide to the millions of Hindus residing in this vast country. Then, from the very first, probably from the moment when with other Aryans he entered India, he has been intellectually in advance of the rest of the Hindu race. Endowed with a subtle mind, which he has trained to the utmost keenness, he has in turn encountered and beaten the intellects of all the other tribes, and attained a position with which it was deemed hopeless to contend. Again, the Bráhman is not only a thinking but a reading man. He possesses and reads the holy canon *Vedas*, *Shastras* and *Puranas*. He has been the author of Hindu literature, and is still its custodian; and yet education, the education of our English schools, is treating him roughly. The prestige of the Bráhman is on the decline, and he has lived his day. With a better start than others, by reason of his natural endowments he has neglected his opportunities has been too proud and self satisfied to avail himself of them. Already numbers of those far below him in caste-rank, and who formerly were of little or no consideration, are tripping him up and passing on to the front. Before long he will find himself left behind in the race of progress, by those who are seizing the golden opportunities, unless, happily, casting aside his prejudices he chooses to stand on a level with other men, throwing in his lot with them. Then indeed it may be confidently predicted that he will again assert his superiority; once converted to the new order of things he will recognize more quickly than others, and grasp more firmly, the advantages to be reaped from it, and will become in the future, what he has ever been in the past, the leader of public thought in India.

115. The Bráhmans of India, as we find them, are classed under two great divisions of two great divisions, *Gaur* and *Dravira*, each consisting of five tribes; speaking generally, the *Gaur* tribes are found in Northern India, and the *Dravira* in the Dakhan or Southern India. The Narbuddah river forms a fairly accurate line of demarcation between the *Gaurs* and *Draviras*, whilst the most important distinction between them is that the former is of

greater antiquity than the latter, the southerners having in fact originally migrated from the northern tribes. It is with this northern or *Gaur* division of Bráhmans that we have to deal, as the Bráhmans of the Bengal army are recruited almost exclusively from their ranks.

In ancient times the Bráhmans were undivided. They consisted, as is manifest from the institutes of Menu, of one large tribe ; nor is there any record of the period or circumstances of their development into the two grand divisions and ten tribes, in which we now find them, and which are as follows :—

<i>Gaur</i> or Northern Division ...	{	1. Kanoujiya.
		2. Saraswat.
		3. <i>Gaur</i> proper.
		4. Maithila.
		5. Atkala.
<i>Dravira</i> or Southern Division	{	1. Maharashtra.
		2. Tailanga.
		3. <i>Dravira</i> proper.
		4. Karnata.
		5. Gurjar.

The *Gaur* Bráhmans therefore comprise the five great indigenous tribes of Upper India, and embrace the entire country north of the Nabuddah, and extending to the extreme west of the Punjab. The term *Gaur*, while it has this general use, is also of limited application, and is the special appellation of one of these five tribes.

116. The five *Gaur* tribes are entirely distinct from one another, both in regard to marriage and eating food, and are also of course in these respects quite distinct from the five *Dravira* tribes of Southern India. Each tribe has, speaking generally, its geographical limit, as shown in the annexed tabular distribution of the *Gaur* division.

KANOUIJIYA BRAHMANS.

117. The first, as well as the most numerous of these tribes, is the *Kanoujiya*, which is again divided into five sub-tribes as follows :—

Tribe, <i>Kanoujiya</i> ...	{	Sub-tribes, <i>Kanoujiya</i> proper.
		" <i>Sarwaria</i> or <i>Sarja-paria</i> .
		" <i>Jijhotiya</i> .
		" <i>Sanadhiya</i> .
		" <i>Kanoujiyas</i> of Bengal.

Of the four first of these sub-tribes (more particularly the *Kanoujiyas* proper, and *Sarwaris*.) by far the greatest portion of the Bráhmans serving in the army are composed.

1. The *Kanoujiyas* proper are sub-divided again into seven

houses, of which the families are distinguished by the familiar denominations of *Awasthi*, *Misr*, *Ditchit*, *Sookul*, *Tribedi*, *Pande*, *Pathukh*, *Doobe*, *Tiwari*, *Bajpei*, and *Chaube*. They inhabit the country of the old kingdom of Kanouj, and are to be found more or less in other parts of the North-Western Provinces, extending from Hummeerpore through Upper Bundelkund, Futtehpore, Cawnpore, Etawah, into Shahjehanpore. They are not to be found much to the west of Etawah. Another but unimportant branch of the *Kanoujiya* Bráhmaṇ is found in Bengal (see tabular statement.)

- II. The *Sarwaris* or *Sarju-parias* are even more numerous than the *Kanoujiyas* proper. They are said to have migrated from *Kanouj* across the *Sarju* river in Oudh, and are therefore closely connected with the *Kanoujiyas* proper. The *Sarwaria* Bráhmaṇs are also sub-divided into three principal clans, *Garg*, *Gautum*, and *Sandel*, with their distinctive titles of *Pande*, *Doobe*, *Tiwari*, *Misr*, *Sookul*, *Chaube*, *Upadhiya* and *Ojha*. This tribe as their name indicates are properly inhabitants of *Trans-Sarju* districts, but in point of fact they are much more generally diffused, being perhaps the most numerous of all the Bráhmaṇ tribes. They are to be found in Baraich, Gorruckpore, all along the borders of Nepal, in most of the districts of Oudh, in Azimgurh, Jounpore, Mirzapore, Ghazipore and Arrah, and as far south as Allahabad and Benares. Associated with the *Sarwaria* Bráhmaṇs are two spurious sects, the *Sawalikhis* and *Bhuinhar* Bráhmaṇs, of whom there are over 200,000 in the North-Western Provinces. They are regarded as bastards, and rank very low in the social scale of Bráhmaṇs, albeit that the Maharajah of Benares is a member of the latter sect.
- III. The *Jijhotiya* or third sub-tribe of *Kanoujiya* Bráhmaṇs, is found chiefly in Bundelkund, spreading to the south and south-west in the Jhansi, Nagode and Lallatpore directions, down to the borders of the Narbuddah river. They do not rank as high in public estimation as the *Kanoujiyas* proper or the *Sarwaris*, and there are not so many of them in our service.
- IV. The *Sanadiyas*, the fourth sub-tribe of *Kanoujiya* Bráhmaṇs, occupy a tract of country, making a triangle formed between Pillibheet, Muttra and Etawah, having for its base the country bordering on the Jumna and Chambal rivers. This embraces Pillibheet, Badaon, Futtehgurh, Alygurh, Mynpoorie, Muttra, Agra, and a portion of Etawah. Thus the *Sanadhiyas* lie between the *Kanoujiyas* proper on

the east, and, as will be seen presently, the *Gaur* Bráhmans proper on the west.

- V. *Kanoujiya* Bráhmans of *Bengal* are the fifth and least important sub-tribe of *Kanoujiyas*. They occupy various localities in Eastern Bengal, and call for no comment here.

SARASWAT BRAHMANS.

118. The *Saraswat* or second tribe of *Gaur* Bráhmans is a very ancient branch of the Brahmanical family. They occupy a tract of country to the north-west of India beyond Delhi, and which was once watered by the famous *Saraswati* river, the goddess of which is the wife of *Brahma*. This ancient family of Bráhmans, found as far west as Scinde, are a comparatively primitive race, who, unlike their other brethren, are not above cultivating their lands, which they claim to have occupied before Jats and Rajpoots became dominant in those parts. They are divided into four sub-tribes—*Panjati*, *Ashbans*, *Burahi*, and *Bhawan* interspersed with each other, and having no geographical limits.

GAUR BRAHMANS (PROPER.)

116. The *Gaur* Bráhmans (proper) are the third tribe of the great division of *Gaur* Bráhmans. They are divided into fifteen sub-tribes, of which the *Ad-Gaur* (the original *Gaur*) and *Taga* Bráhmans are the chief. The *Ad-Gaurs* claim precedence of race over all other Bráhmans whatsoever, but their claim to the distinction is very questionable, the subject being involved in much doubt and uncertainty. They are to be found in great numbers in Saharunpore, Mozuffurnugur, Meerut, and Bijnour, as well as in the neighbourhood of Delhi, Rohtuk, and Hissar. There is a branch of this tribe to be found also in Bengal proper, but how they got there is not clearly established.

MAITHILA BRAHMANS.

117. The *Maithila* or fourth tribe of the Bráhmans of Upper India are to be found in Tirhoot, Northern Behar, Bhagulpore, and in the towns and cities of Mirzapore, Jounpore, and Allahabad. This tribe likewise has four sub-tribes, *Maithil*, *Sarat*, *Joga*, and *Changola*, which are pretty equally dispersed, and have no geographical limit.

ATKALA BRAHMANS.

118. The fifth tribe of the *Gaur* Division are the *Atkala* or *Ooriya* Bráhmans of Orissa. They do not enlist in the ranks of the army and need not therefore be noticed here,

<i>Tribes.</i>	<i>Sub-tribes.</i>	<i>Clans.</i>	<i>Locality.</i>	
The Gaur, or Northern Bráhmans.	1. <i>Kanoujiya.</i>	1. Gautum. 2. Sandi. 3. Bharadwaj. 4. Upman. 5. Kasyap. 6. Kashtip. 7. Garg.	{ Futtehpore, Cawnpore, Etawah, Hummeerpore, Banda, Shahjehanpore.	
		2. <i>Sarwaria.</i>	{ 1. Garg. 2. Gautum. 3. Sandil.	{ Along borders of Nepal, nearly all Oudh, and as far south as Allaha- bad and Benares.
		3. <i>Jijhotia.</i>	13. clans.	Bundelkund.
		4. <i>Sanadhiya.</i>	15. clans.	{ Agra, Muttra, Etawah, Mynpoorie, Alygurh, Budaon, Futtehgurh.
		5. <i>Kanoujiyas of Bengal.</i>	{ 1. Varendra. 2. Rarhiya. 3. Pashchatiya. 4. Dakshinatiya.	{ Eastern and lower Ben- gal, the Mukhurjees, Banerjees, &c.
	2 <i>Saraswat.</i>	{ 1. <i>Panjati.</i> 2. <i>Ashibans.</i> 3. <i>Barahi.</i> 4. <i>Bawan.</i>	82 clans.	{ To the North-west of Delhi; a primitive agri- cultural race, living for- merly along the banks of the Saraswati.
	3 <i>Gaur proper.</i>	{ 1. <i>Ad-Gaur.</i> 2. <i>Taga Bráhmans</i> and 13 others.	31 clans.	{ Muzuffurnuggur, Saha- runpore, Deyra Doon Bijnour, Meerut, Mo- radabad and Bengal.
	4 <i>Maithila.</i>	{ 1. <i>Maithil</i> 2. <i>Saratri.</i> 3. <i>Joga.</i> 4. <i>Changola.</i>	Numerous clans.	{ Tirhoot, Northern Be- har, and principal cities of Jounpore, Mirzapore, Goruckpore, and Alla- habad.
	5. <i>Atkala.</i>	3 Sub-tribes	Do.	Orissa in Bengal (Ooriyas)

119. The Bráhmans are the most conservative of all the natives of India. Naturally the quickest and most intelligent, and best able therefore to master what he undertakes, he neutralizes his great advantages by refusing to depart from any, even the least of his traditions and customs; but although himself bigotted to his religion, he intrudes it not on others, the more so as he can make no converts.

A gallant soldier, he is capable of the highest discipline. Naturally clean and tidy, he is always smart on parade. Trustworthy above others in money matters, he is equal to any in endurance, and though physically weak as compared to some other races, proves their equal under great or protracted deprivations.

120. His intellectual superiority points him out also as the man to be entrusted with independent command, when the necessity for so employing a native cannot be avoided. He seldom or never deserts, and has perhaps a finer sense of *military* honor than any other class of native.

Intelligence.

Exclusiveness.

121. Against all this it may be said, and with truth, that his extreme exclusiveness militates to a prejudicial extent against his general usefulness.

122. A Bráhmán is a most frugal liver. His ambition is to spend as little on himself as possible, and yet he will not hesitate to spend large sums, sometimes all he has, on a marriage or some domestic festival. He never takes menial service, however straitened his circumstances may be. When the regular sources of livelihood fail, a Bráhmán may, as a last resource, glean, cultivate, or in case of extreme necessity he may trade, but in no extremity may he enter into menial service, or do anything inconsistent with gravity and composure.

Customs.

123. Amongst Bráhmáns, as with every class of Hindu, the women do not join in the society of the men, and are not admitted to an equality with them. Even when walking together the woman always follows the man, although there may be no obstacle to their walking abreast.

Women.

124. Strictly speaking, the life of the Bráhmán, as prescribed by the institutes of *Menu*, is one of laborious study and severe austerity. According to the institutes, the *first* quarter of his life must be spent as a student, combined with abstinence and humiliation. His attention must be bestowed unremittingly on the Vedas, and on no account be wasted on worldly studies. The *second* quarter of his life he lives with his wife, discharging the ordinary duties of a Bráhmán reading and teaching the Vedas, performing the sacrifices, bestowing alms, and begetting a son. The *third* portion of a Bráhmán's life should be spent as an anchorite in the woods; exposed to extremes of weather, "without fire, houseless, wholly silent, and feeding on roots and fruit," he must still carefully perform all the prescribed forms and ceremonies of religion. The *fourth* stage of his life is like the third, excepting that relaxing the more austere exercises, he relapses into meditation on the divinity, till at last he quits the body "as a bird quits the branch of a tree at its pleasure."

Rule of life.

125. It is true that this fourfold division of life with all its

Rites and observances. restraints, is now laid aside as regards the community, though many individuals still adopt the observances which formerly were obligatory on all. Such having been the rule of life prescribed for all Bráhmans, it is not surprising, notwithstanding the modifying influences of ages, that their life, at the present day even, should be surrounded and encumbered with the performance of endless forms and observances. From a Bráhman's birth his career, as has been shown already, is hampered with ceremonies as wearisome as they are numerous. Even in the matter of his daily food he has to go through formulas that to many would be intolerable, though in this respect, nearly all the higher classes of Hindus share with him the same prejudices. His nearest female relative, not excepting his wife, cannot eat with him. They may cook his dinner and take their own meals after the men have finished, but they never sit down together. If away from his family as is generally the case with the Sepoy, he prepares his own food and eats it, in any case, in this fashion.

126. A space called "*Chouka*," about five feet square, but of well defined limits, is marked on the ground, and within it the fireplace or "*Choola*" is constructed. The whole is then *leaped* with mud or cow-dung. The materials for the meal being placed within the *Chouka*, the Bráhman steps outside and purifies himself by washing his feet; this he repeats whenever he has occasion to step outside the *Chouka*. He then returns and prepares his meal. Before cooking the Hindu always bathes, taking the opportunity to change his *dhotie* or loin-cloth when in the water. If sufficient water is available, he immerses himself at least twice, facing the east, reciting certain prayers the while. Whilst eating, the clean *dhotie* is the only garment worn, though a kerchief (*angocha*) for wiping the face and hands, may be thrown over the head or shoulders. It is essential also to wear the *Janeo* or Bráhmanical cord, which indeed is never laid aside. Dinner over, the *Chouka* is left and the hands and feet are again washed, and then *pun* and tobacco can be indulged in. Should any one of a foreign caste touch the *Chouka* after it has been prepared all the food within its limits is considered defiled and cannot be eaten.

127. Ordinarily only one meal is eaten at noon called *bhogan*, but sometimes another is taken at sunset. All food is eaten with the fingers. No high caste Hindu will partake of food that has not been prepared either by himself, his relatives, or members of his own special *gote* or clan. This prohibition however does not extend to dry food such as parched grains, whilst the bread or cakes called *poorees* and those sweetmeats, in which no grain forms an ingredient, may be taken from an ordinary confectioner or *halwaie*, by all, but one or two especially exclusive tribes of Bráhmans.

128. The food of the Bráhman strictly speaking is almost without restriction. The Gaur Bráhman is the only one to whom all flesh is forbidden. To all others

the flesh of goats and sheep, of pigeons, deer, and game of all kinds is allowed, as also fish; but strange to say, comparatively few avail themselves of the permission. Whether this be from motives of economy, or simply a self-imposed abstinence, it is difficult to say. Certain it is, that practically the staple food of the Hindu is confined to unleavened bread (*chappatees*), rice, all manner of spices, the different kinds of dall, and every sort of vegetable, except turnips, beetroot, and onions, which are forbidden. Nearly everything is cooked in clarified butter (*ghee*), and assafoetida is often added to impart richness to some of their dishes. The drink of the Bráhmaṇ consists of water, milk, and sherbets.

129. Of stimulants, spirits and wine are absolutely forbidden.

Stimulants. The Bráhmaṇ may eat opium or *bhang*, take snuff or chew tobacco, but may not smoke either it or *ganjah*.

130. The Bráhmaṇ only uses metal vessels in cooking, as they can be readily purified by scouring.

Cooking utensils.

131. There are three daily periods for devotion called *trikal*, one hour before and after sunrise, one hour before and after noon, and one hour before and after sunset.

Hours of prayer.

sunset.

132. The principal and never omitted portion of dress of the Bráhmaṇ (and Rajpoot also), is the *dhotee* or loin-cloth, of which there are always two, one being changed daily during the before-dinner bath, and which he always washes himself. Next the skin is worn a short jacket called *mirzaie*, over that another of thicker material called *anga*, or if reaching the knees, *chakaliya*. In every case the opening is on the right side, in contradistinction to Mahomedan clothing, of which the opening is on the left. This applies equally to all classes of Hindus.

Dress.

133. The Bráhmaṇ, though he makes an excellent soldier, cannot be said to have any special weapon. His mission is chiefly to study and teach the holy writings, and to set an example of sobriety and composure.

Arms.

134. Such being his mission it is not surprising that for many centuries, the Bráhmaṇ was the only educated class worthy of the name in India. Of their language Marshman says—"The Bráhmaṇs crossing the Indus brought their own language (the Sanscrit) from the west, where it was in constant use—as the ancient inscriptions in Persian testify—and diffused it through the north of India, in connection with their religion. The word Sanscrit signifies 'refined,' and that language bears every indication of having received the improvements of the *literati* for many centuries, till it became the most exquisite medium of communication in the world."

Education.

135. The Bráhmaṇ widow cannot re-marry. Within our own time, she not unfrequently immolated herself on the funeral pile of her husband, but this practice has long since been put a stop to.
- Re-marriage of widows.
Satti.

RAJPOOTS.

136. The second of the great Hindu castes is called *Kshatrya*, *Chuttry*, and *Rajpoot* almost indiscriminately. The Rajpoots are certainly the present representatives of the second or great military division of caste laid down by *Menu*. They are styled also the "royal" race of India, of which they were for many long years the rulers. The great Hindu families, descendants of mighty potentates, are still in the main of Rajpoot blood. Combining from the earliest times the functions of ruling and fighting, no houses in India can boast of a longer pedigree or more splendid history. At the present time the profession of arms is universally regarded as a natural and legitimate one for members of this caste. Hardly a family of Rajpoots exists, without one or more members serving in our army, and although their numbers are doubtless less than they were before the mutiny, they are still looked upon as the best field for the recruiting of our army.

137. The physique of the Rajpoot peculiarly fits him for the profession of a soldier. A fine up-standing muscular man, combining, as he does, a love for athletic sports with a military carriage, it is not surprising that amongst the younger members of a family the military profession should be very generally sought after. As has been said before, the Bengal Army at one time was composed almost entirely of this class, and the profession of arms has become a tradition among them.

Physique. Profession of arms.

138. The Rajpoots were originally divided into two equal branches, *Surujbansi* or solar race, and *Chandrabansi* or lunar race, to which were subsequently added the four *Agnicula*s or fire-tribes, *Pramara*, *Parihara*, *Chalukiya* and *Chauhan*, of which the first and last are far the most important and numerous. These were afterwards further divided into 36 royal tribes, and over a hundred *gotras* or clans. As so many of our soldiery are taken from this class it is deemed advisable to give an alphabetical list of these clans or *gotras*, distinguishing the royal tribes and those which obtain chiefly in Oudh, from the remainder, which are scattered generally over the north-west of India. The census returns of 1865 show the Rajpoots as numbering about three millions in the north-west provinces alone, or nearly one-tenth of the entire population, and they are equally numerous in the province of Oudh, as well as in the districts of Delhi, Goorgaon, Kurnal, Hissar and Rohtak.

Branches and clans.
Numbers.

139. Perhaps the chief characteristic of the Rajpoot is pride of

Character. Pride of race. race, he glories in his title of "*Sing*," and asserts in his every movement his claim to his warrior descent. This is not so marked, though quite distinguishable, in the ranks of our service, as it is in Rajpootana, the stronghold of the tribe. In that vast tract stretching to the south and west of the northern-western Provinces the Rajpoot may be distinguished anywhere from the common herd by his carriage and it may be by his insolence too. It is there that the mighty chiefs of his tribe have ruled from time immemorial, and where every man is taught that to him individually is entrusted the honor of the clan to assert and defend it. In our ranks all this is much modified, the defects almost all disappear and there remain only those traits which in a soldier command our admiration and approval. "Indeed it is amongst the Rajpoots, perhaps of our army that we find the best specimen of Hindu character retaining its peculiarities while divested of many of its defects. Here we acquire a clearer conception than elsewhere of their high spirit when roused, their enthusiastic courage and generous self devotion, so singularly combined with gentleness and softness of heart, together with an almost boyish simplicity and playfulness."

140. The Rajpoots have preserved the ceremonies of the Hindu Customs. Marriage of caste as religiously almost as the Bráhmans. Widows, Infanticide. They cook once a day with much fuss and form almost every-one for himself, after the most approved Hindu fashion, and are very particular about caste-marks and distinctions. Their widows may not re-marry, and it is their excessive point of honor to marry their daughters to none but men of the highest tribes, that renders their daughters such a burden to them, causing female infanticide to be so common. For this reason the higher the grade of Rajpoot in the social scale, the commoner the crime of infanticide among them, owing to the impossibility of obtaining fitting mates for their daughters. This difficulty is still further increased by marriages between members of the same clan or *gotra* being prohibited. No matter how large the clan may be, it is considered to form one family, of which the men are all brothers and the women all sisters, though in point of fact there may be no blood relationship between them. Their wives again are shut up after the Mahomedan fashion and are lost for agricultural labor. Altogether as Campbell says, "Rajpoot females are a very unsatisfactory institution, and this goes far to weigh down, and gives a comparatively bad name to men who are often industrious enough."

141. As traders and manufacturers the Rajpoots are but little known, but unlike the Bráhmans, a vast number of the Rajpoot caste are addicted to agriculture. In some parts of the country agricultural Rajpoot villages are both strong and numerous, but where-ever this is so their institutions resemble those of the Jats.

142. In the matter of education Rajpoots are far behind the

Education. Bráhmans. Few educated men spring from their ranks, and the vast majority of those that join the army are ignorant of all letters whatsoever. They generally manage after a time to acquire enough of the Nagri and Kayntee character to indite a very simple, and not easily deciphered epistle to their homes, and to spell out with difficulty a similar effusion from their friends.

143. Weapons. The Tulwar, shield, and matchlock are the weapons of the Rajpoot in his native country, where the disarming act is not in force, and he not unfrequently carries a dagger also.

144. Sports. They are very expert wrestlers, and exhibit great strength in wielding enormously heavy clubs. They excel also in single stick, running, jumping and indeed take kindly to anything requiring strength or agility.

RAJPOOT TRIBES—(Alphabetically arranged.)

Agastwár,		Bundéla.		<i>Gaharwál.</i>	
Ahbán.		Bundelgoti,	Oudh.	Gain.	
Améthiya,	Oudh.			Gamoha,	Oudh.
				Gargbansi,	Oudh.
Bachalgoti.		Chakwain.		<i>Gaur,</i>	Oudh.
Bachgoti.	Oudh.	<i>Chaluk</i> (Solanki)		Gautum,	Oudh.
Baghél.		Chanamiya.		Gholawat.	
Bahériya,	Oudh.	Chandéla,	Oudh.	<i>Gohil.</i>	
<i>Bais,</i>	Oudh.	<i>Chandrabansi.</i>		<i>Grahlot.</i>	
<i>Balla.</i>		<i>Chahán,</i>	Oudh.		
Banafar.		Chaupata khamb.		<i>Han</i> (Hün.)	
Barellian,	Oudh.	<i>Chawará.</i>		Hárá.	
Bargyan.		Chéyn.		Hardwas.	
Barhaiya.		Chummergeao.		Hayobans.	
Barwár.		Chundaauriya.		Horiya.	
Batauriya.					
Bhadauriya.				Jadbánsi.	
Bhala-Sultán.		<i>Dabi.</i>		<i>Jaitwa.</i>	
Bhanwág.		<i>Dahia.</i>		Janóie.	
Bhatti-gájar.		<i>Dahima.</i>		Janúturwa.	
Bhes,	Oudh.	Daugast.		Janwár.	Oudh.
Bijheniya.		Dhakaha (Bhojpore).		<i>Ját.</i>	
Bijhériya.		Dhanawast.		<i>Jhala.</i>	
Bilkbáriya,	Oudh.	Dhanis.		<i>Johiya</i>	
<i>Bir Guíar.</i>		Dhrigubansi,	Oudh.		
Bisen,	Oudh.	Dikshit.		Kachar.	Oudh.
Biuriha.		Domkatar.		Kachhrura.	
Brigubansi.		Donwar.		<i>Kachwaha.</i>	
Buharwáliya.		<i>Dor</i> (or Doda.)		Káká.	
Buinhar.		Durgbansi.		Kanpuriya,	Oudh.

Karamwár.		Ponwar (Pramára,		Sarpakhariya.
Karchúliya.		Pawar),	Oudh.	<i>Sarwaiya.</i>
Katti,	Oudh.	Pachtoriya.		Sarwár.
Kausik.		Palwár,	Oudh.	Seelowta.
Khichi.		Pandobáns.		<i>Sengárh,</i>
Kinwár.		Paotar.		<i>Silár.</i>
Kouraha.		Parbuttiya.		Singhél.
Kuchbhawániya.		<i>Parihára.</i>		Sirmoor.
Kuchhaniya.		Patili.		Sirnet.
Kulhans.	Oudh.	Patsáriya.		Sisodiya.
				Sobrunniya.
Lautamiya.		Rághúbansi.		Sombansi, Oudh.
Lathór.		Raikwar,	Oudh.	Sonák.
		Rajkumár,	Oudh.	Sonwár.
Mahrawar.		Raotar.		Soolankhee.
<i>Mohil.</i>		<i>Raipáli.</i>		Sri-mat.
Monas.		Rajpoot Pahári	Oudh.	<i>Suraj-bansi,</i> Oudh.
Munniyár.		Rajwár.	Oudh.	Surhaniya.
		<i>Ruthór.</i>		<i>Tak.</i>
Nágbansi.		Rikhlbansi.		Teha.
Naikumbh,	Oudh.	Róra.		Tieriya.
Nanwág.				Tilonta.
Narainee.		Sahinwar.		<i>Tuár.</i>
Naranliya.		<i>Sakarwál.</i>		Ujain.
<i>Nikumpa.</i>		Sakarwár.		<i>Yalu.</i>
Niniarwár.		Sangját.		

Memo.—The thirty-six royal tribes are in *italics*, and the tribes obtaining in Oudh are noted accordingly.

JATS.

145. The Jâts, who are still numbered amongst thirty-six royal races of Rajpoots, are not however admitted to their caste privileges, nor are they allowed to intermarry with them. Much ingenuity has been expended in speculations as to the origin of this tribe, but as most of the theories set up point to their close connection, at some period or another, with the Rajpoots, and as they bear a very strong resemblance to them in many ways, they may appropriately be noticed here. There is an inclination in some quarters to regard the Jâts as of Scythian origin. Indeed this descent has been claimed for them by some sections of the tribe itself, whilst other influential portions of the race attribute their origin to the Rajpoot stock, which is much the most plausible theory of the two. Certain it is, that whether you take them from the plains of Scinde where they abound, or from the neighbourhood of Delhi or the Doab, their language is Hindée, with some modifications. Mr. Beames says—"This argument derived from their language alone, is strongly in favor of their Aryan origin, for if they were Scythian conquerors

what has become of their Scythian language ; and how comes it that they now speak and have for centuries spoken an Aryan language, a dialect of Hindee." Again, it is hardly possible to imagine two races more dissimilar—"The Scythian is short, square built, and sinewy, with a broad face, high cheek bones, and long narrow eyes, with the outer corners turning upwards. His home is a tent ; occupation pasturage ; his food flesh, milk, and other productions derived from his flocks ; his dress is of skins ; his habits active, roving, and restless." The Jât on the other hand is tall loosely built, of comely well formed features, and when not excited, languid and lazy. He lives in a house, is clad in thin and often gaily colored garments ; he lives chiefly on grains ; the possession of land is his great ambition ; he never moves but from necessity ; and whenever he can do so, leaves the care of flocks and herds to inferior classes.

146. The Jâts are indeed essentially an agricultural race, and their locale is very extended. They may be traced from Kurrachee up the valley of the Indus as far as Peshawur. Along this tract and as far east as the Ravee, they are nearly all Mahomedans. Then, throughout the Panjab province, they number nearly one-half of the entire population, and are there styled Jâts, with a short *a* : whereas, in the neighbourhood of Delhi, in the districts of Goorgaon, Hissar and Rohtak, and in the Upper Doab they are called Jâts. The only practical difference between the Jât of the Doab and the Silkh Jât is, that the latter refrain from tobacco and allow their hair to grow its full length, which is fastened up in a knot or *khes*. The Jâts are very numerous also in the districts of Mozuffurnuggur and Meerut, and are found in considerable numbers in Rohilkund and Shahjehanpore, as well as Alygurh, Bhurtpore, and Agra, whilst one-half of the Hindu population of the Muttra district consists of members of this tribe.

147. Physically, the Jâts of the Punjab, and especially those from the Hissar and Rohtak districts, are a particularly fine race of men, as is also the Bhagar or western Jât of Biccaneer who is essentially a horseman from his youth ; but to the south of Delhi they deteriorate in point of physique. The Jâts make excellent soldiers, brave, hardy, and obedient, and have, even before our time, performed most creditably in the war arena.

148. While perfectly amenable to discipline the Jât is of an independent disposition, peculiarly sensitive of abuse and injustice, and apt under the pressure of wrongs, real or supposed, to relinquish a service undertaken much more from a love of soldiering than as a means of gaining a livelihood. Undemonstrative almost to moroseness, he is fond of his profession as a soldier. Devoting himself to his parade work, he displays physical qualities and powers of endurance of no mean order.

149. The Jâts, though Hindus and venerating the Ganges, Jumna

Freedom from caste prejudices. and some of the principal Hindu deities, are singularly free from caste prejudices. They cook and mess together in a body anywhere and without religious ceremonies. They will eat flesh of all kinds, except beef and neel-gaie, one person generally cooking for the household. Nor are they forbidden to take drugs or stimulants, and the Jât of the Doab is allowed, and indulges very freely in, the use of tobacco, which to his Sikh confrere is an absolute abomination. Notwithstanding they are permitted to intermarry with the Sikh Jât under certain restrictions.

150. Before praying they consider it necessary, like other Hindus, to bathe, to purify their bodies, and so render Ablutions and devotions. their devotions the more acceptable. If prevented by sickness or other cause from bathing properly, they must at least wash their faces and hands, and swallow water in view to purification. During their devotions they turn their faces, like the Brâhmaus, to the east.

151. The Jâts are, in common with all other Hindus, believers in the transmigration of souls, and ablution in the river Ganges is the great rite practised by them, believing that purgation from sins is thereby attained, a circumstance, if further argument were wanted, strongly indicative of their Hindu origin.

152. Many of their observances however, both domestic and religious, are not altogether consonant with Hindu precepts. Second marriages are common among them, and their religion admits even of a plurality of wives, especially if the earlier marriage proves unfruitful. They may also cohabit with, though they do not actually marry, an elder brother's widow. The ceremony is that of *Chadda-dalna*. The practice has become almost universal amongst the wealthier Jâts, who pay very highly for their own and their son's wives. The custom has the double advantage of perpetuating the deceased brother's name, and of being economical. When the eldest son of a Jât dies, he utilises the piece of female property (*Mal* is the term used) which he has bought, and hands her over to the next son, who marries her by the simple process of throwing his scarf (*Chaddu*) over her head, whence the name of the ceremony.

153. There is a disposition among the Jâts to acknowledge the unity of the Godhead, rejecting most of the fables of the Puranic mythology. Hence probably one of the chief causes of their becoming ready disciples of the Sikh religion.

154. As agriculturists the Jâts are the best farmers and the most

Habits and customs. industrious of all the races of the Punjab and North-West Provinces. Patient and long-suffering as tax-payers, quiet and peace-loving as subjects; but like their parent stock, the Rajpoots, easily roused in obedience to their chieftain's call, or to avenge a wrong. They possess in fact all the good qualities of an agricultural race, though somewhat addicted to the crime of cattle-lifting.

Education. 155. The Jâts, like most other agricultural races in India, are almost destitute of all education. Those that enter the service and ambitious of rising in it, readily acquire the art of reading and writing, but in their primitive state are content to remain perfectly ignorant of all book learning.

Dress. 156. The wealthier classes of Jâts are very fond of dressing gaily, and they are particularly partial to the color red. The dress of their women is of various colors, generally well assorted, and very picturesque.

Arms. 157. Their favorite weapons are the spear, sword and shield.

GOOJURS.

158. This tribe is also one that claims descent from Rajpoot stock and their strong resemblance to the Jâts who are constantly found as their neighbours, goes far to confirm the supposition. That they are not aborigines is clearly proved by their fine manly Aryan type.

Locality. 159. The Goojurs are very numerous in the North-Western Provinces and the Punjab, and their importance may be rated by the tribe having given its name to Gujrat and Gujranwalla in the latter province, as well as to Guzerat on the western coast of India. Those in the Punjab are nearly all Mahomedans.

Habits and customs. 160. The Goojurs are addicted to both pastoral and agricultural pursuits, but do not make good farmers, being of unsettled, restless habits, and much addicted to cattle-lifting and plunder. They possess large herds of cattle and are to be generally found holding lands in the grass jungles bordering on the Ganges, Jumna, Hindun and other rivers. Their name is said to be derived from the words "gau," cow, and "char" (charna) to graze.

Physique. 161. Physically they are splendid men, massively built, stalwart and bold, with large beards, which, in the Punjab at least, they often dye blue with indigo. They are said to be abandoning their thieving propensities, and gradually becoming more addicted to habits of peaceful industry. If this be so, they cannot fail to prove excellent matériel for the army.

162. The use of stimulating liquors and drugs is not interdicted amongst Goojurs, and they are very fond of tobacco both to smoke and chew.

Stimulants.

163. Their staple food, like that of all natives, is unleavened bread; but they not unfrequently treat themselves to goat's flesh. Their large powerful build is often attributed to the free use of milk, which they consume in immense quantities, and of which their herds always afford an abundant supply.

Food.

164. They conform to the Jât custom in regard to the marriage of a younger brother with an elder brother's widow. Their ordinary marriages are conducted much in the same manner as those of Rajpoots, and so indeed are all their rites and ceremonies, modified to suit their unsettled wandering habits of life.

Ceremonies.

165. The arms of the Goojur, were he allowed to carry any, would be the *tulwar* and spear, but the weapon with which he is most at home is an iron-bound *lathee* or bludgeon.

VAISYAS.

166. The social position of the Vaisyas in early times has been a fertile source of controversy. That they were then chiefly engaged in agricultural pursuits seems certain, whilst we know in the present day they are almost exclusively mercantile.

Social position in ancient times.

167. Moreover, they have, in the social revolutions that have passed over the country, become so intimately blended with the Sudras, that it is difficult now to distinguish between them.

Social position at the present day.

168. Some few tribes of Vaisyas claim to have preserved their individuality, and this is about all that can be accorded to them. But from this amalgamation of Vaisyas and higher Sudras has arisen a race infinitely more important and powerful than any that preceded it, a race corresponding to our middle classes in England. In ancient Hindu periods the Vaisyas and Sudras were accounted of no political weight or authority, merely because they were Vaisyas and Sudras; and for the same reason they never aspired to rise to a position of social equality with the Brahman or Rajpoot. But under British rule, a radical change has taken place in the relations of the castes, but it has taken more than a hundred years to effect it. A conviction however has at last reached this middle class, that in the eyes of their rulers all castes as well as all men are equal. This conviction has percolated slowly to them through the medium of our schools and colleges, through the repeated assurances of our legislators, by the every-day doings of local officers as well as by the testimony of their own senses, till the fact stands recognised and acknowledged. In the words of Mr. Sherring—"The result has

Middle class of India. Important social revolution

been a national revolution and reformation. It is manifest to any person of reflection, that the old landmarks, separating class from class by impassable barriers, and preserving all in certain relative positions for ever, no longer exist in their former intensity. The dominant Bráhma and Rajpoot tribes have lost all their authority, and much of their influence. The Sudra no longer thinks it a sin to read; on the contrary he conceives it possible to become as wise as the Bráhma, and does not hesitate to endeavour to surpass him. The Sudra and the Vaisya aim at the highest official posts, and find themselves elected often over the heads of high-caste applicants whom they are now acute enough to perceive to be often inferior to themselves. The Bráhma looks on with amazement at the subversion of his order, and the destruction of his interest."

169. Here then we have a class at once enterprising and powerful, prosperous as well as energetic, par excellence the progressive class of India at the present day. But unfortunately very few of this influential body adopt the profession of arms. They are nearly all engaged in mercantile or commercial pursuits. But this progressive movement cannot long be confined to its present limits. Its influence must soon be felt by the masses below, if indeed it does not happily extend to the higher classes themselves.

170. This powerful middle class consists of bankers, brokers, traders and the great writer caste of Kayaths, though properly the latter occupies a position at the head of the Sudras, or midway between them and the Vaisyas.

KHATRIS.

171. The most important of the Vaisya tribes are the Khattris. Sherring says of this class, that it is "an ethnological puzzle. In some respects they resemble the great *Kshatriya* or Rajpoot race, in others they differ from it. Instead of being addicted to government and delighting in war, they are exclusively devoted to trade, and consequently are naturally placed among the commercial classes. Judged by their own traditions and social habits, they are as high in rank as Rajpoots, laying claim indeed to a closer observance of the ancient customs of Rajpoots than that which is practised by the modern Rajpoot tribes."

172. The Khattris are very numerous in the Punjab, indeed too numerous for all of them to engage in commercial pursuits, and many therefore are obliged to cultivate, take service, and follow various avocations. They are to be found also in varying numbers all over the North-Western Provinces, and are very numerous in the neighbourhood of Benares.

173. Campbell, in his *Ethnology of India*, says of the Khattris, that
 Character. "though not usually military in their character, they are quite capable of using the sword when

necessary. Mulraj, the famous governor of Multan, was a Khatri, and so were many of Runjeet Sing's chief functionaries. Even under Mahomedan rulers in the west they have risen to high administrative posts, and for private enterprise and energy in quite recent times, we have a very distinguished member of the Khatri caste, in Jotee Purshad the well-known contractor of Agra.

174. In their character of enterprising traders, the Khatri have
 Enterprising traders. penetrated further into Central Asia than any other Hindus whatsoever.

175. The Khatri are divided into two great branches, Poorbiyas
 Sub-divisions and clans. Pachainiyas, or Eastern and Western Khatri, with numerous sub-divisions and clans.

176. Their ceremonies, &c., are much the same as those already
 Ceremonies. described as common to all Hindus, excepting that their marriages are conducted quietly without the noise and tumult obtaining amongst most other castes.

177. Personally the Khatri are fair-complexioned and handsome ;
 Physique. of finer physique also than any other race whose pursuits entail sedentary habits.

178. In the matter of education they are, in common with the
 Education. Kayaths, more advanced than any other caste, not excluding the Bráhmans; and as they are eagerly seeking the education of our English schools, will soon establish their position at the head of the educated classes in India.

KAYATHS.

179. This caste may fairly be termed another ethnological puzzle. They claim descent from one *Chitr Gupt*, who had two wives and twelve sons, each of whom is regarded as the founder of one of the present twelve clans of Kayaths, but it is nowhere shown who this *Chitr Gupt* was, or in what epoch he lived. They regard him as a species of divinity by whom they will be judged hereafter.

180. On the other hand Menu describes the Kayaths as the off-
 Origin. spring of a Bráhma father and Sudra mother, a mongrel origin, ranking them at once amongst the Sudras.

181. In point of education, intelligence and enterprise, however,
 Education. they surpass even the Khatri, which accounts for the anomalous position they hold in Bengal. Mr. Campbell, in his *Ethnology of India* says—"In Bengal the Kayaths seem to rank next or nearly next to the Bráhmans and form an aristocratic class." Aristocracy of mind must be here referred to, rather than of caste.

182. Pleaders practising in our courts of law, clerks and accountants in our public offices are nearly all Kayaths, all that are not Bengalee baboos at least ; whilst the offices of *Kanungo* and *Patwarri* or village record-keeper, are almost monopolized between them and the Khatrias.

183. The proportion of men able to read and write in this caste is perhaps greater than in any other. Indeed they are usually styled the "writer class," par excellence, of India.

184. The Kayaths pay greater homage to female deities than to male, they are sometimes called *Devi putr*, or the sons of Devi, a term used to denote a female divinity in general.

185. They are a quiet order-loving people given to literature and the more useful kinds of study. Eager after knowledge they readily avail themselves of the various schools throughout the country in order to acquire it.

186. Marriage expenses, excessively heavy with every caste of Hindu, is ruinously so with the Kayaths, the debt incurred on these occasions being sometimes handed down from father to son.

187. The Kayaths are permitted by their caste laws to gamble and to drink intoxicating liquors ; and certain occasions have unhappily become notorious for the display of these propensities. This habit more than any other goes to prove their inferior origin in the eyes of the natives, and has damaged to a great degree the position which their education and talent would otherwise secure for them.

188. In physique the Kayath is inferior to the Khatri, he displays the deficiency in bone and chest measurement, so universal with the writer classes of India, whether Hindu or Mahomedan.

189. The twelve clans, into which they are sub-divided, are independent of each other as they do not intermarry nor eat cooked food together, but they are permitted to smoke the same hookah, and they all drink indiscriminately together. One or two of the clans eat meat and fowls which the rest abstain from.

Numerous members of this caste are landed proprietors in various parts of the Punjab and North-Western Provinces, as well as in Oudh, where Mr. Carnegy, in his "Races of Oudh,"—says—"Many of them formerly rose to high places and honors under the kings of Oudh."

SUDRAS.

190. Under the denomination of Sudras is included every caste that stands lower than the Kayaths in the social scale of Hindus. Whether the Sudras in the first instance were Aryans, or aboriginal inhabitants of India, is a question on which many conflicting opinions have been expressed. Most probably they were tribes produced by the union of the one with the other. It has been shown that even in the time of *Menu*, the offspring of all mixed marriages whatsoever were accounted Sudras, so that whatever may have been the pristine position of the caste, their individuality, if they ever had any, has long since completely vanished. As has been previously stated when the intermarriages became frequent, it was necessary to establish a table of pedigrees, and the lawgiver *Menu* settled all this. We find from it that if a Bráhmaṇ woman so far forgot herself as to marry a Sudra, the offspring of the union were styled *Chandalas*, and formed a tribe who had to subsist on animals dug out of holes, and are described by *Menu* as the "most degraded of mortals, not permitted to perform rites in honor of their forefathers," and so on throughout all the different combinations.

191. Although the position of these inferior castes, is the same now as formerly, that is, at the bottom of the Hindu social scale, it is evident they must have in the progress of ages first imitated, and finally adopted outright, many of the rites and customs of the superior castes. On this point Mr. Sherring says—"It is worthy of note, that in adhering to certain caste rules and distinctions, many of the lower castes are much more rigid than the higher castes. The *Burhai* (or carpenter) caste is an instance in point. Its sub-divisions cannot intermarry, yet Bráhmaṇs of the same tribe in all its sub-divisions commonly intermarry and Rajpoots, not merely of one tribe but of many, frequently intermarry and come to each others' festivals. The *Chumar* or leather dealer is many degrees lower still in the social scale than the *Burhai*; nevertheless all the seven clans which compose that caste are every way as stringent and exclusive on the subject of marriage, as the separate clans of the *Barhai* caste. It is hard to account for this strange spirit of exclusiveness among the lower castes, not found to the same extent among the upper. Perhaps it arose originally from their servile imitation of the upper castes. Being more ignorant, and less intelligent, they have copied their masters so closely and pertinaciously that at last they have gone beyond them."

192. But this servile imitation does not extend in a baneful degree, at least to all the prejudices of the higher castes, and is nearly confined in its exclusiveness to the matter of marriage. Their eccentricities in this respect interfere but little with their utility as soldiers, and it is their comparative freedom from restrictions on their food, water, and manner of cooking, &c., that causes them to be sought after for enlistment in the army.

193. They all dearly love taking part in the Hindu festivals;

they observe Hindu rites but not with objectionable strictness ; and when enlisted, whilst putting aside so far as practicable the degradation and uncleanness of their inheritance, they assume with their uniform many of those soldierlike qualities, which have so long characterised the Rajpoot and the Bráhmaṇ.

194. This assumption of what may be called caste, by the newly-recruited Sudra, is of itself a good quality, as inspiring a feeling of self-respect, and when combined with such qualities as courage, endurance, fidelity and obedience, goes far towards the making of a first class soldier.

195. At the head of the Sudras are the large agricultural races of India, consisting of Koormies, and Mooraies or Kachis ; and next to them come the extensive and ancient pastoral tribes of Ahirs and their congeners the Garariyas.

KOORMIES.

196. The Koormies are an extensive agricultural tribe, very generally distributed over the North-west Provinces and Central India. They are to be found in large numbers all over the Doab, in Rohilkund, in Goruckpore, Bundelkund, Mirzapore, Allahabad, Azimgurh, and the province of Oudh.

197. Like most Hindu tribes they are sub-divided into several clans or sub-divisions which neither intermarry nor eat together.

198. As cultivators the Koormies are most industrious and persevering. Notwithstanding indifferrent implements, poor soil, and unfavourable weather, their unfailing application and perseverance enable them in most seasons to earn a sum sufficient for their frugal requirements.

199. The agricultural is perhaps the most self-relying race in India, displaying perfect confidence in the ability of the soil to return in kind more than the equivalent of the labor expended upon it. Of all the castes too they have permitted themselves to be perhaps the least diverted from their proper avocation.

200. Their women, like the Játnees, assist in tending cattle cultivating the fields and in every kind of outdoor work except actual ploughing.

201. It is perhaps owing to their industry, general respectability, and to their quiet orderly habits that they are regarded with much respect by other castes.

As they are as private members of the community, so in the ranks

they make good, well behaved, orderly soldiers.

202. The Koormies conform to all the Hindu observances, and when they can afford it observe their rites and ceremonials.

203. There is no restriction on a Koormie's food except of course beef, fowls and pork, but their principal food no doubt consists of unleavened bread, *dal*, spices and every kind of vegetables to which they are particularly partial.

204. They may partake of all the stimulating drugs, but are not allowed to drink spirits.

205. Education is altogether neglected, but those that take service though slow, are possessed of average intelligence and ability.

MOORAIES.

206. The Mooraies, like the Koormies, are cultivators, and are variously styled Koeries or Kachis in different parts of the country.

207. The Mooraies correspond very nearly to the market-gardeners of England. They cultivate large gardens in the neighbourhood of towns and cities, growing onions, pumpkins, and all manner of native vegetables, with which they supply the city markets.

208. The Mooraies are also the most extensive growers of poppy in India, and most of them own a little bit of ground on which they produce this profitable crop.

209. Like the Koormies they are a most industrious race, their women assisting in the cultivation of their lands. Together with the Koormies they form the great agricultural class of the North-West of India.

210. The Mooraies are also sub-divided into several clans, with certain restrictions as to intermarriage.

211. They conform generally to Hindu usages, but are not so particular in the matter of ceremonial rites, &c.

212. In the matter of food, drink, stimulants, &c., they resemble as nearly as possible their congeners the Koormies, and their manners and habits are almost identical.

AHIRS.

213. The Ahirs, commonly called *Gwallas*, are a very numerous

tribe of herdsmen, distributed generally all over India.

214. They are referred to by *Menu* as being descended from a Bráhmaṇ by an *Ambusthu* woman. By the Hindu genealogical tree *Ambusthas* were the offspring of a Bráhmaṇ father by a Vaisya woman. It follows therefore that the Ahirs are three parts Bráhmaṇ and one part Vaisya, but they are accounted Sudras nevertheless, owing to their mixed origin,

215. The Ahirs are sub-divided into three main divisions—*Nandbans*, *Jadubans*, and *Gwalbans*. The two first are again broken up into something like 150 clans between them. These clans intermarry within their own divisions on terms of equality, avoiding like all other Ahirs only the four *gotras* or clans nearest related to their own.

216. Sir Henry Elliot states, regarding their history, that they were formerly of much greater consideration in India than at present. "In the *Ramayana* and *Mahabharata* the *Abhiras* in the West are spoken of, and in the Puranic Geographie, the country on the western coast of India from the *Tapti* to *Devagurh*, is called *Abhira* or the region of cowherds. When the *Kattis* arrived in Gujerat in the 8th century, they found the greater part of the country in possession of the Ahirs."

217. The breeding, rearing, and herding of cattle is the legitimate calling of the Ahirs. They sell milk, butter and other articles, the produce of their flocks. Very few of them engage in trade or the cultivation of land.

218. In the neighbourhood of Delhi and Meerut and the lower Punjab generally, there is a decided connection between the Ahirs and the Jâts and Goojurs. The three eat, drink, and smoke together, and they have many points in common. They make equally good soldiers, and are certainly less troublesome and more industrious than their fellow herdsmen, the Goojurs.

219. The marriage of a younger brother with an elder brother's widow is permitted with Ahirs as with Jâts and Goojurs.

220. The Ahirs conform to all the Hindu ceremonies so far as their means permit. Intoxicating liquors and drugs are not interdicted though not much indulged in, and they can eat meat, with of course the usual restrictions, beef, fowls, and pig.

221. The tulwar with shield is the weapon of the Ahir, and the "*gransee*," a species of bill-hook used by the Ahirs, when tending their herds, for cutting

branches and clearing jungle, but which makes also, on occasions, a very formidable weapon.

GARARIYAS.

222. The Garariyas are the shepherds of India. They rear and tend goats and sheep, leaving larger cattle to the care of the *Ahirs*.

223. Like all other tribes they are sub-divided into seven or more clans which do not intermarry. The younger brother may marry an elder brother's widow, in this as in numerous other tribes.

Sub division. Marriage of widows.

224. One at least of the clans of this tribe are Mahomedans.

One clan of Mahomedans.

225. Some of them manufacture blankets, whilst one clan deals exclusively in the wool and hair of the flocks of their kinsmen. Very few engage in agriculture.

Occupation.

226. Garariyas conform to most of the Hindu customs; they bathe always before dinner but do not *poojah*. They eat only with those of their own caste, and hold cooked food to be defiled by being touched by an outsider.

Rites and customs.

227. They eat the flesh of goats, sheep, deer, and other kinds of game, but not beef, fowls or even wild pig.

Food.

228. Garariyas both eat and smoke tobacco. Spirits are forbidden but they cannot take *ganja* or other intoxicating drugs.

Stimulants.

229. Their rites at births, marriages, and deaths are much the same as with the higher castes of Hindus, but are not carried out with the same strictness as to detail.

Ceremonies.

230. Garariyas cannot be said to have any particular weapon. They carry the "*gransee*" or bill-hook of the Ahirs, which answers the double purpose of a weapon, and an implement with which they cut down branches and green food for their flocks.

Weapons.

231. They make quiet orderly soldiers.

With the Garariyas these notes are closed.

232. At the present time there are enlisted into our ranks *Dóms*, *Dhánuks*, *Chamárs*, *Mehrturs*, &c., but with these, as soldiers, the compiler has no experience.

Dóms, Chamárs, Mehturs, &c.

232. It may however be taken as a rule that the lower classes imitate the manners and customs of the higher, when they are thrown together. There is no reason therefore, why even the sweeper, having emerged from his native squalor, should not in the hands of the Drill Sergeant be moulded into as good a soldier, to all appearances at least, as the Rajpoot or Bráhma.

P. HARRIS, *Major, now Lt.-Colonel,*
11th Regiment Native Infantry.

V.

THE POLITICAL MOOD OF THE DAY IN RUSSIA.

The German *National Zeitung*, discussing this subject in one of its recent numbers, says:—"It is a peculiar fatality that a whole series of reforms, inaugurated by the Russian Government after the emancipation of the serfs, have rapidly degenerated to such a degree that the sections of the common-wealth they were intended to stir up from a profound stupor of long duration, are falling into a more and more pronounced decay. The institution of a free Press, granted to the capitals Moscow and St. Petersburg; the reform of the administration of justice; and above all the introduction of rural diets (*Zemstoos*—local assemblies of representatives of all classes, from the nobleman down to the peasant): have in no way justified the expectations with which these reforms were introduced. The newspapers have gone on from bad to worse, their present attitude being so unprincipled and unworthy as to be downright disheartening. Sensation is only cultivated for its own sake; and editors advocating one thing in the morning, stand up for the direct contrary thereof in the evening. The proceedings within the courts of justice have frequently resulted in scenes which can only be compared to theatricals, not to speak of several really monstrous acquittals. And as to the representative system embodied in the *Zemstoos*, it has not only failed to take root among the people during the fifteen years of its existence, but its working has also triennially fallen off in point of such meager results as it did bring forth at first. To refer a task to these bodies, means to stay its further development: for the delegates fritter away their time with enacting Mirabeau and Marat *en miniature*, and carefully avoid devoting themselves to the intricate wearisome study of the needs of their district or province. It is the curse of the immaturity of Russia's 'educated classes,' shewing itself whenever the Government attempts to allot any administrative work to them. For the spirit of topsy-turvy'dom at once gains the upper hand, even where the situation of itself would seem to exclude all possibility of its finding room to arise. The Government sanctions the establishment of Sunday-schools, reading societies, endowment funds for students, and similar useful institutions; but scarcely has any progress been made, when disciples of Nihilism—the worst type of all revolutionary elements—contrive to gain access, and go on disseminating their pernicious theories, thereby obliterating the original aims of such foundations. Or, to give another instance: some poor folk combine for the purposes of improving their minds by the study of geography (a branch of knowledge which is peculiarly attractive to the people); but on the second or third occasion, the voluntary gentlemen teachers dilate

upon countries enjoying every blessing because of having no government or law whatever.

"Class hatred has no existence in Russia. The manufacturing centres are not numerous, and lie far apart: while the workmen employed in them are peasants having voluntarily given up their title to the grant of land due to each of them, because of preferring the life in the factories. It is exactly among the peasantry where confidence in the Emperor is found to be unlimited, and on the strength of the fact that Nihilism finds no favor with the people at large, a number of educated Russians would fain regard the ravings of the Nihilistic school as something unimportant. But this is a grave error! For many children of the better educated classes, now growing up, adopt the doctrine that everything beyond the pale of Nihilism—that is, everything expressive of respect for the laws, morals, and constituted authority: or bespeaking love for one's country—marks an "obsolete point of regarding life and things generally." It is owing to this apathy on the part of those who should above all others make a stand against it, that Nihilism has gained so powerful a sway over the educated classes throughout Russia, as to have already obliterated even the last vestige of aversion to crime amongst its votaries. The police functionaries and the authorities have but too often been lenient to a fault, because they would not disoblige certain families, although their dwellings were noted hatching-houses of Nihilistic stratagems. The thorough absence of moral consciousness of any kind, which is but rarely wanting even in the most hardened criminal, renders the thorough-going Nihilist peculiarly dangerous: for he has no more a notion of the term 'crime,' than the Turk can have of 'bigamy' as understood in the West. On the face of this fact, the Russian authorities are all the more to blame for having suffered Nihilism to spread beyond all bounds by their undue lenience and lukewarmness.

P. MOSA.

UNITED SERVICE INSTITUTION OF INDIA.

NOTICE is here given that the subject of the Essay for the Institution Gold Medal, for this year, is "A Transport Service for Asiatic Warfare."

The terms of competition are :—

1. The Candidates must be Government Gazetted Officers.
2. The Essays must be legibly written, or printed, not exceeding 32 Pages of the Size and Style of the Journal.
3. The Essays must be forwarded to the Secretary on or before the 1st May 1880.
4. The Essays must be strictly anonymous, but each to have a motto, and be accompanied by a sealed envelope with the motto written on the outside and the name of the Candidate inside.
5. The Essays will be submitted for decision to three Referees chosen by the Council.
6. The successful Candidate will be presented with the medal at the Annual Meeting (if he be present), and his Essay will be printed in the Journal.

By order of Council,

A. D. ANDERSON, CAPT. R. A.,

Secretary, United Service Institution of India.

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Officers who may wish to become members are requested to be kind enough to forward their donations and subscriptions at the same time as they express a wish to join the Institution.

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Members on changing their address are particularly requested to notify the change to the Secretary, in order that delay in forwarding the Journals may be avoided as much as possible.

The address book is corrected up to date from the Army Lists, but mistakes are occasionally unavoidable, unless members themselves promptly notify their change of residence.

Members proceeding to England on leave, who wish the Journal to be forwarded to them while absent from India, should inform the Secretary, and send stamps for the postage by Brindisi or Southampton.

When a member appears in orders for leave to England, his Journal is not despatched unless he asks for it, and while absent from India his subscription is not payable unless the Journal is supplied.

Members on return from furlough can obtain the numbers of the Journal that have been published during their absence, by paying the subscription for that period, and all members on returning to India should inform the Secretary of the fact.

The Secretary will be happy to send an Index to volumes I, II, III, IV, V, VI and VII to any member wishing for the same.

A. D. ANDERSON, CAPT., R.A.,
Secretary, United Service Institution of India.

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The Council give notice that Life members to the Institution will be admitted on the following terms :—

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NOTICE.—Back Numbers of the Journal can be obtained at Re. 1 per copy, on application to the Secretary.

As Journals are returned from the Dead Letter Office with effaced addresses, Members who do not receive the numbers in succession are invited to intimate the same to the Secretary.

By order of Council,

A. D. ANDERSON, CAPT., R.A.,

Secretary, United Service Institution of India.

SIMLA. }
20th Sept., 1879. }

ORIGINAL PAPERS.



I.

NATIVE STATES' CONTINGENTS.

THE Feudatory chiefs of India enjoy an aggregate revenue of some fifteen millions sterling, or above one third of the sum in sterling represented by the income of the British Government in India. They maintain forces aggregating some 3,15,000 men with 3,500 guns, which perform all the duties of court ceremonial, garrison, military police, guards and escorts throughout territories aggregating nearly 6,00,000 square miles with nearly 50 millions of inhabitants. These figures, from a pamphlet published by me in 1874 (*The use of native chiefs*. W. H. Allen & Co.,) are somewhat under truth.

The armed force, military and police, of the British Government is about 2,50,000 men this excludes a proportion of the police engaged on civil duties which are not performed in the native states by the forces whose strength I have given. It also, of course, excludes the English troops, which cannot be brought into the comparison, their duties being of a different nature.

This force of 2,50,000 men performs all the duties detailed in the case of the native states, throughout a territory of 8,31,963 square miles with 184 millions of inhabitants. It is, at the same time, always ready to detach a considerable portion of its strength, at least one-tenth, for offensive operations.

A proportion based upon population, taking our native forces of all kinds at 2,25,000 men (exclusive of the surplus available for active warfare) gives under 65,000 men, of similar quality to our native regular and military police, as adequate for the garrisons, police, guards, escorts and state purposes of the whole of the Feudatories. I have based the proportion on population not on area, as barren wastes do not require garrison. Nevertheless a scattered population does require a larger body of men for internal police than if collected on a smaller area.

If then, we double the quantity to allow this, and to compensate for inferior quality, we find that 130,000 men will suffice the chiefs for all purposes instead of the 3,15,000 at present maintained by them. The surplus of 185,000 armed men represents probably the equivalent of some 50,000 good troops that the chiefs could maintain, if permitted, for the purpose of taking their proper share in the burden of Imperial defence.

The forces of the Feudatory chiefs are unreservedly held at the disposal of the British Government. They maintain the utmost military strength they can, partly certainly as a much cherished symbol of sovereign state, but mainly to enhance their importance and power of rendering service in the eyes of their sovereign. We all know from what they have done in the past, how important is their rôle in the maintenance of our power. We have seen during the past year how eagerly they still desire to support this rôle. But, much as they have done, they can do, they ought to do, and they desire to do, much more.

The figures that I have given shew what is the chiefs' ability. Their willingness has been, I conceive, sufficiently demonstrated; and, as far as they are concerned, any arguments to shew that it is their duty to share in the military defence of the Empire are quite superfluous. Nor is the present paper the place to go into such arguments. Suffice to say that the total of their present contributions, in cash and men to a common defence stated by the Finance minister in 1877 at 17, millions sterling (and now of course greatly exceeding that figure) is £6,00,000 per annum. Granting that a portion of the British Forces costing 17 millions sterling are engaged in aiding the police (whose cost is not included in that sum) in maintaining law and order and is therein performing a task of which the native states' armies relieve our Government within those states; the rest at any rate, is garrisoning the frontiers, or is held in reserve for field operations, tasks to which the chiefs should contribute; or in watching the armies of the chiefs themselves, a task which they should not impose by maintaining large forces, unnecessary for internal purposes and difficult of control. Estimating the cost of our forces so engaged at five millions and twelve millions respectively, the chiefs whose aggregate revenue exceeds one third of that of the Empire, who are protected by us from internal rebellion and foreign aggression, who enjoy free of expense the vast material advantages of British civilization these chiefs contribute to the latter outlay only one twentieth part.

For some years past it has been evident that the time was approaching when some means must be found of increasing our military strength without enhancing the burden upon our finances. One of the ex-Finance ministers of India has recently pronounced the condition of Indian Finance to be almost desperate. If the increased military expenditure which is now being forced upon us is to be borne by our revenues as they at present exist the above opinion is probably just. If so, then expedients must evidently be sought for increasing our military strength at the least possible cost and for meeting that cost.

I have long advocated three such expedients:—(1) the employment of native states' contingent to augment our native army: (2) the organization of the Anglo Indian Civil population as a Landsturm supporting our English army: (3) the annulment of the permanent settlement in Bengal by the imposition upon land in that Province

of a progressive demand, rising up, within a period, to the full rates prevailing elsewhere. Of these three proposed measures I have already, in the March number of this Journal, described the second. The first is that which I now bring forward. Both depend in great measure upon the third—but 'ways and means'—though an important military question—is not one to be discussed in these pages. It only remains, therefore to offer in detail my suggestions for the employment of contingents from the armies of the native states on a permanent footing, instead of temporarily, in time of war, as in the present case of the forces of the Panjab Chiefs.

By usage and precedent dating from the time of the Moghuls, the Princes and Chiefs of India are bound to render to the Suzerain military service in time of war. That without training in time of peace, without modern equipment and modern organization, such service of their forces is worthless is now patent to all. I propose therefore to define and limit this general obligation by fixing a certain extent of service to be rendered both in war and peace. The chiefs will thus take their due share in the burden of imperial defence, their contingents will be rendered of real value for service in the field, the disorderly mobs of armed men in the various states will be reduced to a very large extent thus releasing most of the Imperial troops that are now engaged in watching them.

Under this proposal each state will supply a permanent contingent in some British garrison. These contingents will be under their own officers—with British officers attached thereto for instruction and guidance on the footing of those twice lent to the Persian army. The contingents will of course be incorporated in the District and Division within which they are stationed. My suggestions for their distribution, strength and organization will be found in the table attached to this paper. That table shews a strength of some 34,000 troops that would be added to our native army by these arrangements, which will entail a probable diminution of the turbulent levies within the native states by some three times that number. The table shews that this arrangement will set free 27 British Regiments of infantry and 9 regiments of cavalry from the garrisons taken up by the Native States' contingents, besides probably several British regiments of cavalry and infantry, English and Native, from the garrisons in these states. Thus the strength of British troops rendered available will probably equal or exceed the number supplied by the Native States.

The map which accompanies this paper shews the native states, their area, population, revenue and military strength. It also shews the distribution of the British Army. It will be observed therefrom that the proposed distribution of the native states' contingents is so arranged that, while placed at a safe distance from their states, they will yet be not so far in the cases of the smaller states, as to entail serious inconvenience upon the chiefs. Moreover, they are so echeloned

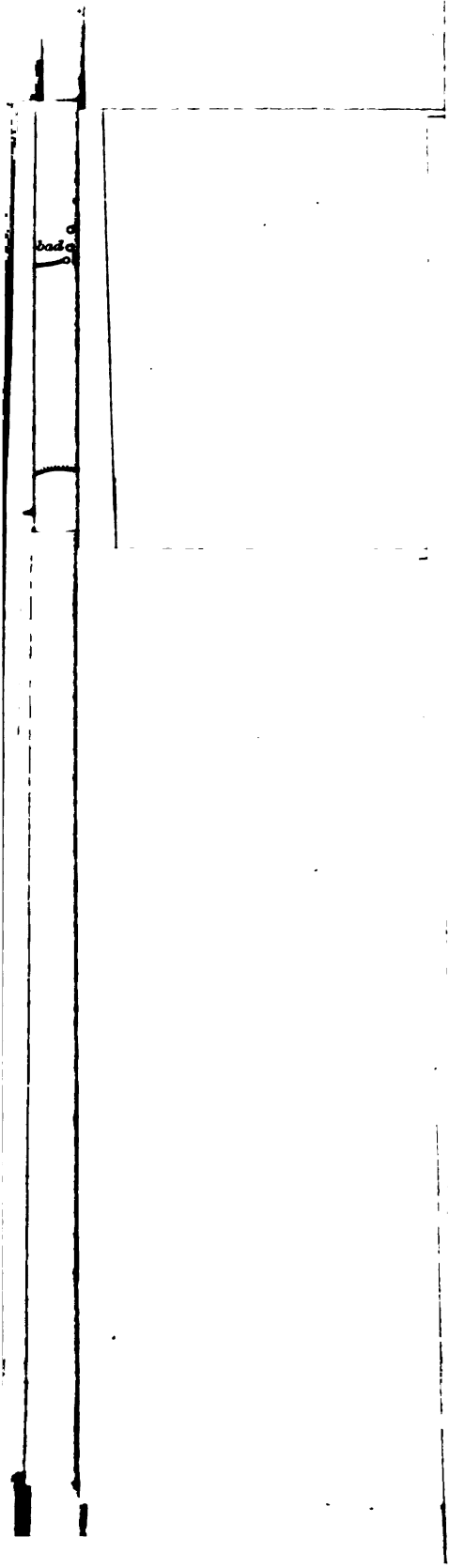
along the frontiers that, while taking all the frontier duty, they will hold no important strategic points—*e.g.* Faizabad has an European garrison as well as that furnished by the Jat States: and they are well supported by British garrisons.

ALGIERS

3rd June 1879.

}

(Signed) H. GREY.



II.

A RESERVE FOR THE NATIVE ARMY.

BY LT. E. G. BARROW, 7TH BENGAL N. I.

The moment seems particularly favorable for discussing the above subject, as without doubt the Commission now sitting at Simla will recommend considerable changes in the organization of the native army, more especially in the matter of reserves ; and also because the subject has already been introduced by Captain Anderson in a paper contributed to the April number of the Journal of the U. S. Institution. In the multitude of councillors there is wisdom, and the more freely the subject is ventilated and discussed the more are we likely to obtain really sound opinions and valuable practical suggestions. It is then with the object of provoking discussion on a theme fraught with interest to the Indian army, and big with its future destinies, that we venture to enter on so complex and difficult a subject.

What we now propose to discuss is not the best system of reserves conceivable, for that would involve a complete re-organization of the army, the formation of regiments of several battalions, the establishment and localization of regimental depôts, and other equally desirable but perhaps unattainable reforms, but the system of reserves most suitable to our present organization and best calculated to meet its requirements.

As Captain Anderson has pointed out, our present system of bringing up regiments to war strength is unsatisfactory and in case of war on a large scale utterly impracticable. In the late Affghan campaign even, the only means of increasing the strength of regiments was by recruiting. The result was that regiments went into the field numerically weak, that recruits being urgently required by all regiments, the demand became greater than the supply, and those obtained were often of very inferior quality, that their training was hastily and unsatisfactorily carried out, that owing to this desultory, perfunctory training the few who joined the ranks were of very little use, and finally that the greater number of the extra two hundred men authorized, were not ready to join the ranks till after the campaign was over. When such are the results of our present haphazard system, after an almost bloodless campaign of a few months duration, it will scarcely be surprising if the Indian Army breaks down under the trying strain of a great and prolonged war, involving a heavy and continuous drain of human life. Captain Anderson has we think rightly indicated the source from which we should obtain our reserves. We are yearly losing a number of thoroughly efficient soldiers, who having served a few years take their discharge and are no more heard of, men in the prime

of life, the very material for an Army Reserve. To secure the services of these men should be our first care, and the question is how can we best induce them to render their services available when needed, with due regard both to economy and efficiency.

Captain Anderson proposes that the Reserve pay of a sepoy should be Rs. 2 per mensem or in other words Rs 24 per annum. Now as nearly all sepoys are at the time of their discharge in receipt of Rs 8 per mensem, they would look on 16 rupees out of the 24 as their proper pay for the two months they would be out for training, which would leave only 8 rupees as a retaining fee for the remaining ten months of the year. We very much doubt if many men would consider that, a sufficient inducement to enter the Reserves with the constant liability of being called away from their homes to do the bidding of the 'Sirkar' at the nethermost parts of the earth. Where we have a mercenary army to deal with, there can be no doubt we must be liberal, if we wish to form a reserve, and it is useless to resort to expedients dictated chiefly by economy. Moreover the system of direct annual payments even if it induces men to flock to the Reserve, is not one that with any degree of certainty secures the attendance of the men when required for active service. It is true, in England under the same system the Reserves when called out last year turned up almost to a man, in spite of great hardships endured by many in so doing, but here in India we cannot rely on the same sense of patriotism as an incentive to obey the call of duty. Call out the Reserves of certain districts in England to fill the ranks of regiments in Zululand, and we very much doubt if they will respond so eagerly to the call! In 1878 it was a national crisis that set the great heart of England throbbing with warlike enthusiasm, and caused her sons to rush to arms, but in India even should such a crisis occur its import would fail to be comprehended by the ignorant cultivator on the banks of the Ganges or the Sutlej who would probably argue to himself that it would be better to give up his miserable retaining fee, than leave his home and family to encounter hardships and dangers in distant China or Turkestan. It is true that with an agricultural population such as ours, we can always lay our hands on the men, but it is precisely at such critical moments when men's minds are excited that in a country like India, it is least desirable to employ measures of coercion.

At such times we want the men to come forward voluntarily, attracted by the emoluments dependent on their appearance, rather than under the compulsion of the Policeman and the Magistrate. We repeat then that a system of direct payments by periodical pittances is not the one to ensure your reserve men turning up when wanted, and moreover the payments made up to date to every man who did not appear, would be so much money absolutely thrown away. In our opinion the only way to ensure your reserve men coming forward when required, and of obviating loss by those who do not, is to offer *prospective* advantages of such a nature that a man will be very loth to forego them.

Such prospective advantages are presented by a system of prospective Pensions, and in addition to this we firmly believe that a pension is the real bait with which to lure Jack Sepoy. He will enter the Reserve far more readily in the certain hope of a small pension at some future day when he himself is past work, than he will merely for the sake of an annual wage which ceases while he is still strong and healthy. But by the term 'Pension' it must be clearly understood that we do not mean pension commencing from the date of leaving the colours, but from *completion* of Reserve Service. The prospect of obtaining such a pension will be a strong inducement to the Soldier to enter the Reserve, and the certainty of forfeiting it will be a weighty argument to ensure his appearance when called out.

The rules we suggest in modification of those proposed by Captain Anderson are :—

1. Soldiers to be eligible for the reserve after 3 years service.
2. To be called out for 2 months training once every two years.
3. To be liable to embodiment whenever required.
4. To enter the reserve with the same rank as that held under the colours, Lance rank, excepted.
5. To receive when out for training the same pay as they received with their regiments, staff pay excepted.
6. To get no pay except when out for training or when embodied.
7. To receive after 20 years service, that with the colours included, pensions at the following rates.

Sepoys	Rs. 3	per mensum.
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Naicks and Havildars	„	5	„	„
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8. If declared unfit for active service before the expiration of that time to receive a bonus in compensation of, Rs. 15 let us say for every year of service.

Let us consider these proposals one by one.

1. Three years service is generally acknowledged as being ample to ensure the thorough training of a soldier, but a less period is not calculated to instil, with sufficient force, habits of regularity and implicit obedience.

2. We believe that a two-months training every other year would be quite sufficient to maintain the efficiency of the Reservist. Once

thoroughly trained, the soldier soon picks up his drill again. The saving too would be immense. When you take into consideration travelling expenses as well as pay the cost of a training which cannot well be less than 20 Rs. and a saving of 20 Rs. every other year means a 'lakh' of Rupees *per annum* for every ten thousand men in the Reserve. In addition to this if you call out the whole force every year you have to employ double the Staff of Drill Instructors and Officers and you have to arrange for a double amount of accommodation. By only calling out half every year, Reserve service is made less irksome, economy is duly observed, and the general efficiency of the force is not impaired.

3. Proposal 3 requires no comment.

4. This proposal will not have any material effect on the general scheme, as very few who attain to the non-commissioned grades would ever be desirous of entering the Reserve. Still there are circumstances under which a man may deem the step desirable, and it seems hard in such cases to deprive him of the chance of entering it. Such non-commissioned officers too might be made useful in various ways, in case the Reserve were embodied, - as Havildars and Naiks at the various depôts, as recruiting agents, as subordinates in Transport trains &c. In short, suitable employment might easily be found for a great many more non-commissioned officers than are ever likely to enter the Reserve.

5. If pay is only given when men are out for training, it ought certainly to be as much as it was when the men were with the colours. You don't want the men to be losers, but there are so many little incidental expenses connected with an occasional training, that if you only pay them six rupees or so, they certainly will lose.

6. The object of rule 6 is to prevent men being paid for work they do not perform, you cannot tell whether a man will redeem his obligations until the occasion arrives or his period of service is completed, and unless he does fulfil his obligations, direct money payments are simply thrown away. Let him be paid for work actually performed during training and for compensation, let him look to his pension.

7. In this proposal lies the gist of the whole scheme, and the chief radical divergence from the suggestions made by Captain Anderson. He proposes direct Payments. We, a pension on completion of service. He says "24 Rs. per annum for two months annual training and liability to service." We say "training every other year and liability to service, in return, full pay during training and a pension on completion of service." The question is, which scheme will tempt the most men, which will best ensure their presence when wanted, and which in the long run is the more economical. On the first two points we have already given our views. As regards expense the latter would certainly involve a greater annual expenditure, but if you want a piper you must pay for him, under the former scheme you would probably in five cases out of ten have to *want* him. The man would say to himself "I have

only one more year to serve, why should I risk my life for twenty four rupees." Whereas under the pension scheme he would argue "I have served the 'Sircar' for nineteen years in hopes of a pension and now if I do not go, all those years of service will be thrown away".

Ours is a mercenary army, and depend upon it men wout go into the reserve for love of country, you must bribe them with love of 'Pice.' And after all is the expense of such a system as we have proposed so very great? Statistics of *civil life in England* show that of every 10,000 men alive at 25, but 8,400 or so, will be alive at 42, and the probability of life at that age is 24 years, we may safely conclude that the conditions of life in India are still more unfavorable to longevity, and that of 10,000 men who enter the army at 22 and the reserve at some later period, certainly less than 8,000 will be alive at 42 on the completion of their service.

Moreover should war break out, and the reserves be called on for active service, a large proportion will never survive to receive the pensions which are their due, and a still larger proportion will from the privations and exposure they have to endure, suffer in health and die much sooner than they otherwise would have done. This may be an ungenerous even an ungrateful way of regarding the question, but nevertheless such contingencies must be taken into consideration when weighing its merits.

Let us roughly calculate the cost of a reserve soldier who enters the service at 22, serves 3 years with the colours puts in 8 trainings, and lives to draw pension for the full average period of 24 years:—

				Rs.	A.	P.
3 years pay at Rs. 7—	...	...	...	252	0	0
Half Mounting	...	...	...	38	0	0
Clothing, compensation for dearness of provisions	}	...	...	60	0	0
Total cost of service with the colours				350	0	0
8 trainings at 20 Rs. per training including travelling expenses	...	...	...	160	0	0
Pension at 3 Rs. for 24 years...	...	...	...	864	0	0
Total				Rs. 1374	0	0

Or less than £ 120 for liability to service during 20 years. In fact we offer the sepoy £ 6 per annum to take his chance of an ounce of lead, which is cheap considering the value an individual usually places on his own life.

Compare the above with a soldier who serves 20 years in the ranks and then takes his pension.

3 years service at 7 Rs. per mensem	252	0	0
6 " " " 8 " "	576	0	0
6 " " " 9 " "	648	0	0
5 " " " 10 " "	600	0	0
24 " Pension " 4 " "	1152	0	0

Pay Pension	Total	3228	0	0
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Add to this Rs. 108 for half mounting and about 400 for clothing, Batta etc. and we get a total expense of Rs. 3736 or nearly 3 times that of the Reserve soldier.

Now take Captain Anderson's plan, viz 4 years service, the remainder in the reserve with pay at 2 Rs. per mensem and 2 Rs. compensation for clothing.

3 years service at Rs. 7	...	...	...	252	0	0
1 " " " 8	...	...	...	96	0	0
Half mounting	...	...	...	42	0	0
Clothing and Batta	80	0	0
16 years reserve service at 26 Rs. per annum...				416	0	0

Total Rs.	886	0	0
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An infinitely cheaper scheme than that here suggested, *if* the same number of men respond to the summons when called on for service. On that question the relative merits of the two schemes entirely depends.

8. For men invalided before the completion of their Reserve service we propose compensation in the form of Bonus, as compensation is certainly due, and Bonus offers perhaps the most convenient form. In fact we believe it would be to the advantage of the State if the present Pension system were abolished, and a Bonus system substituted in its place. We should not then see so wonderful a phenomenon as an ex-sepoy drawing Pension for 113 years. Incentives to fraud and opportunities for peculation would be removed. The work of paymasters greatly lightened, and their staff of Baboos considerably reduced.

A native can nearly always obtain 1 per cent interest per mensem, so that a Bonus of Rs. 400 would be equivalent to his present pension of Rs. 4 per mensem. And as most pensioners live considerably more than 8 years 4 months an enormous saving would be effected. But this is deviating from the question at issue.

It now remains to consider how having got our Reserve men, we can best carry out their training, and most efficaciously embody them.

Captain Anderson proposes that 4 or 5 stations should be detailed for every regiment, at which stations the men of that regiment might be

trained with the corps there in garrison, but this system has grave disadvantages.

In the first place in every regiment there are stray birds who came from out of the way localities where their corps do not recruit. In the second, commanding officers of corps which had to conduct the training of Reserve men, would have no direct interest in these men, and the training would therefore in many cases be inefficiently conducted. And thirdly should those corps be called away for active service, no organization would remain for mobilizing the men of the Reserve. In our opinion it would be better to fix a certain number of training depôts throughout each Presidency, and give every man his choice of a training station. The measure would be popular amongst the men, and economical as curtailing travelling expenses, for the men would naturally select the stations nearest their homes.

For Bengal the training depôts might be Dinapore, Benares, Cawnpore, Lucknow, Meerut, Umballa, Ferozepore, Umritsur, Lahore, Pindee and Peshawur. At each a small permanent staff might be maintained, consisting of

- 1 Commandant.
- 1 Adjutant.
- 1 Native Adjutant.
- 1 Drill Havildar.
- 6 N.C.O's as Pay Havildars.
- 20 Sepoys.
- 2 Buglers.

During training this staff might be augmented by officers and Drill assistants from regiments in the neighbourhood. At other times, the Commandant and Adjutant might be utilized as Staff Officers of Pensioners, which would greatly reduce the strain on the Pay Department, the Non-Commissioned Officers as recruiting agents, and the sepoy in keeping the arms &c., in good order.

The training should take place at the end of the cold weather so as not to interfere with agricultural operations. Where no vacant lines or barracks are available, camp equipage might be lent for the accommodation of the men. The men present at training might be organized in six companies, the additional staff of officers and N. C. O's required being obtained from regiments in the neighbourhood.

On mobilization the men would at once proceed to their training depôts, and thence be drafted off as required to the different regiments on service.

Such is the system of Reserves we would propose in modification of that suggested in the April number of the Journal of the United Service Institution of India. The subject however is by no means exhausted by these two papers, a hundred other combinations more practicable and economical, no doubt, may be devised.

III.

CAMELS IN CONNECTION WITH THE SOUTH AFGHAN
EXPEDITION 1878-1879,

*By CHARLES STEEL, Veterinary Surgeon, 16th Lancers, employed
on Special Service.*

Having received an intimation from the Council of the United Service Institution of India that a paper on camels would be desirable for their journal, I am induced to bring forward the results of my observations on the habits, treatment, diseases &c., of that animal during my service in the recent Expedition to South Afghanistan, and, propose that my observations shall be of a character essentially practical, introducing only such technicalities as are unavoidable in the elucidation of my subject, and even then, such as shall be made clearly intelligible to the reader.

Perhaps on no previous occasion has there been so ample a field for gleaning information relative to the camel as used for transport purposes; the enormous losses, as a matter of course attracted my notice; and even had I then been indifferent, the appeal to my olfactory senses at almost every step of the distance from Jacobabad to Candahar would have been irresistible; had I been deficient in ordinary observation, and denied by nature the most useful sense of smell, the emotion of pity must have stimulated my enquiries as to whether my professional training could not devise some means of investigating the subject, and bringing forward suggestions which might relieve the poor animals from the effects of ill treatment, the result of inexperience in their management, and the most revolting cruelties practised upon them by inhuman attendants.

My remarks are founded upon notes made during many a long hour's trudge through the Kutchee desert; the Bolan pass; the Kojuk; over the different plains en route to Candahar; the many times slippery passage of the Bori valley, interspersed with those nullahs, so well known as impeding camel progress; the difficult passes through the chains of mountains on the road back from Kush dil Khan ka Killa to the Indus; many times calculating the distance travelled by counting the number of paces taken by the animal during an hour; seeing camels under almost the extremes of temperature; with deficiency and uncer-

tain quality of forage; when there was frequently dearth, and at times, almost poisonous condition of water.

My mill stop subject comes under so many heads that perhaps it would be better to introduce it in separate paragraphs rather than to attempt any preliminary adjustment to be carried out by arrangement; these, for the convenience of consideration, shall be kept as distinct as possible, so that, if a reader is particularly interested in any one branch, he may not be embarrassed by collateral matter.

General characteristics of the Camel.

The camel may fairly be included under the head of domesticated animals for seldom is he found in a wild state;—So patient and docile is he in our service; so tolerant of abstinence on an emergency; by his arched spine (the hump is not here alluded to) and flat sides so well adapted for the imposition of loads; and by his elastic cushion—like feet to traverse loose sandy ground; that but little observation or reasoning is required to recognize him as a beast of burden, especially designed for certain localities, and to stamp him as the “ship of the desert”; it will be seen as we proceed, how far he is capable of serving us when under different conditions.

With the general appearance of the camel all are familiar; the long neck, prodigious hump, gawky legs, and patient expression of countenance, with a really beautiful prominent eye, are remarkable; the very great disparity in muscular development between the fore and hind limbs, to the disadvantage of the latter, claims especial notice, and, as may be anticipated, anatomists find that the hind quarters are equally deficient in nervous supply; to this want of power behind, we trace the inadaptability of the animal for climbing hills; and who has ever seen the camel attempt more than the very mildest jump? It would appear that the male is unable to support himself on his two hind legs even during sexual connection, for this office is performed in a semi-recumbent position.

Camels are ruminants, but exceptional ones, and may be classed between Ruminantia and Pachyderma; as readily recognisable instances of their differing from ordinary ruminants, the facts of their having two incisor teeth in the upper jaw, the possession of canine teeth both in upper and lower, and the presence of two premolars in upper and two in lower may be here mentioned and other deviations will be subsequently noticed; the wedged shaped teeth of the lower jaw are evidently adapted for browsing on shrubby plants and their dental arrangement altogether indicates that they are *naturally wholly herbivorous*.

The senses of sight and smell are very acute, here the prominent eye comes into play, and by the care with which the selection of such food as Camel Thorn Pipal, Burgot &c., is made, and Mudar, Ganjha, Euphorbium &c. are rejected, we observe that delicate appreciation of whole-

some diet by means of the olfactory powers which strongly argues against the probability of camels voluntarily eating poisonous herbs, as was suspected by some, when the mortality was so great at Quetta; indeed an intelligent Surwan whom I consulted as to the possibility of a poisonous plant called "Akri" being accidentally consumed, informed me that it was an absolute fact that it, and such plants, were carefully avoided; he admitted this plant being given medicinally, combined with salt, in cases of flatulence.

The cloven foot is usually a characteristic of ruminants but in the camel there is a very different pedal arrangement, we certainly observe two short toes with separate hoofs but these more nearly resemble toe nails, the feet are resting upon elastic pads or cushions under the toes united by a common sole, and forming, as above mentioned, an extended pad suitable apparently for the road on which he is most at home *viz* the sandy plain; the sole however is very thick, and the whole cushion so accommodating, that in spite of the presumed adaptability to sand, I must admit it is very tolerant of even rough roads, and that lameness from injured feet on such irregular rocky ground as in the Bolan pass and other places was of infrequent occurrence.

The hump is presumed to be a provision of nature for endurance of long abstinence, a quantity of fatty matter enters into its composition, and the Arab is said to be very careful in looking to its condition before commencing a long journey; from my own observation, I cannot recommend too great a reliance upon this store of nutriment, as I fear that the camel is given credit for a greater tolerance of abstinence than he really possesses, for, if not absolutely starved, it will not be difficult to show that there are very fatal secondary results from want of nutrition; and here it may be appropriately mentioned that the store of water the animal is supposed to be capable of carrying is much exaggerated.

My experienced Serwan (a somewhat aged man who had been with camels all his life) told me that, in hot weather camels required watering every day, in cold they began to fail when without it for three days, and if denied for five days they would die; but this latter subject will receive attention in another part of my paper.

The callosities on the stifles, elbows, and beneath the breast are very characteristic, and the wisdom of such provision is evident when they are couching for the imposition of their load; the one beneath the breast is called "Rahafay," and a severe bruise sometimes occurs to its substructure, resulting in sinuous unhealthy wounds difficult to cure, causing much inconvenience to the animal and consequent loss of condition, but this was *not* a frequent cause of inability amongst the transport camels of the South Afghan expedition.

The long eyelashes may be observed as evident sentinels to give notice of the approach of the numerous offending agents so prevalent in hot climates, and the power of closing the nostrils at will is a provision against the intrusion of irritating substances into the delicately lined respiratory passages; "the mouth seems formed to save for the animal every drop of the fluid excretions of the nose; a channel leads from each nostril to the mid-fissure dividing the upper lip which is continued down into the mouth." (Owen.)

All observers must be struck by the protrusion at times, of a peculiar membranous kind of bag from the mouth of camels, accompanied by a gurgling sound; this bag is called by native attendants the Talu, it usually makes its appearance when the animal is at "must," (or rutting), is not visible until the fifth, or year of puberty, is never seen although existent, in females, and always shows itself on one particular side; the popular and even suggestive idea is that it provides means of refreshment by bringing water into the mouth and fauces, but a most careful post mortem examination made by me failed to detect any duct by which water could enter from the œsophagus. Professor Owen however suggests that "its surface shows the pores of innumerable mucous crypts, and in the ordinary state, in both sexes, the flap may apply its own secretion, and water regurgitated from the storage cells of the stomach to the extended surface of the pharynx and root of the tongue, so as to allay the feeling of thirst," he anatomically describes it as "a broad pendulous flap hanging down from the fore part of the soft palate and usually resting upon the dorsum of the tongue" and adds "in the rutting male the palatal flap is greatly enlarged. I have found it extending ten inches down the pharynx, passing below the margin of the soft palate and the opening of the larynx, into the œsophagus."

I am unable to find any record of a phenomenon frequently observed by me during trying marches, and some friends, of camel experience, whom I have consulted do not appear to have noticed it, viz, that of an oozing of red coloured fluid from some orifice about two inches below the root of the ear, the fluid would appear to be perspiration tinged with colouring matter, it is only distilled drop by drop during extreme distress, and usually preceeds the falling from exhaustion; it painfully suggested the idea of the poor animals *sweating drops of blood* when cruelly urged beyond their powers of endurance.

In further noticing the general characteristics of the camel, it may be remarked that, during progression, both feet on one side are simultaneously moved, giving the peculiar motion familiar to those who have ridden the animal; that it sometimes lives from thirty to forty years; and that its utility is not confined to its services as a means of transport, for it supplies wholesome flesh and milk as articles of food. As an instance of the appreciation of the nutritive value of camel's milk, it is known that Arabs, Persians, Afghans, and Punjabees frequently resort to it as especially nourishing for foals, as it produces greater

stamina than the milk of any other animal ; chemical analysis proves it closely allied to mare's milk in its constitution.

Breeds.

With regard to breeds of camels in India, the variety does not appear to be extensive ; Rajpootana supplies a great many and from that district were derived those which were used during the siege of Delhi ; our camels in South Afghanistan were almost all Scind, amongst which was a very small proportion of females, whereas, with the northern army they are reported to have abounded ; we had a small number of Paharee or hill camels, and a few specimens of the magnificent Persian.

Some from Scind were very fine and powerful, distinguished by their height, length of leg, and paucity of hair, amounting in some instances to nudity, the disproportion in strength of fore and hind extremities being very remarkable, and their susceptibility to climatic changes very great ; the Paharee is much more freely supplied with hair, of lower stature as a rule, shorter in the leg and more proportionate development posteriorly ; these certainly suffered much less from any cause, and I had no opportunity of making a post mortem examination.

The Persian possesses a thick coat, splendid capillary appendages, especially about the neck which has a deep and graceful curve, he has also a wide chest, and short legs, but I was sorry to observe, that, as the climate increased in temperature, the ornamental hair began to fall off in patches, presenting a mangy appearance ; this would probably be restored on the return of cold weather ; there were only a few specimens bought by officers above Candahar as curiosities, so that there was little opportunity of judging as to their qualifications for transport. It is stated that a fossil species, much larger than the ordinary camel, has been discovered in the tertiary deposits in the Sewalik hills.

Anatomical construction, so far as it is especially adapted to the present subject.

My remarks under this head must be mainly upon the anatomy of the respiratory, circulatory, and digestive apparatus. As this is not an anatomical essay a mere outline or elementary notice will sufficiently prepare the reader for appreciation of the practical, physiological, and pathological deductions which are to follow.

The power of closing the nostrils at will has been alluded to ; the air next passes through the nasal chambers to the larynx, which is a cartilaginous box, composed of five elastic pieces, the most remarkable of which is the epiglottis, or lid which closes the opening during deglutition, preventing the ingress of food which would prove violently irritating to its delicate lining membrane ; the whole apparatus is concerned in the modu-

lations of voice, and in the animal under consideration, there are some few peculiarities of formation, but they have no especial bearing on the subject.

Attached to the larynx is the trachea or windpipe, consisting of a number of cartilaginous rings lined by a continuation of the membrane of the larynx, the most remarkable peculiarity in the camel being the number of pieces, the natural consequence of length of neck. This windpipe, on reaching the chest, bifurcates, one branch going to each lung, each branch is again divided and subdivided until it gradually loses its cartilaginous character and becomes membranous only; these are called the bronchial tubes and ultimately end in cells composed of such attenuated membrane, that the air conveyed to them comes into such close approximation to ramifications of blood vessels surrounding, that, by a process called endosmose and exosmose, an interchange of elements takes place and the object of respiration is attained, *viz.*, the oxygenation of the blood, by which it is endowed with its vivifying principle, and the partial depuration of the same fluid. The lungs then are spongy bodies composed of air tubes and cells, blood vessels, and a tissue which connects the parts together, they are divided into two, right and left, which are subdivided into lobes, the peculiarity of those of the camel being, that this latter division is less marked than in most mammalia; the lungs are covered with a fine membrane, of a serous nature called pleura, which is also reflected upon the inside of the chest the secretion from which performs the office of lubrication, and by its means any attrition during the motions of inspiration and expiration is avoided.

The consideration of the pneumonic apparatus would be incomplete without a glance at the circulatory; the blood being oxygenated as above described, and become of a scarlet colour, is carried by veins to the left side of the heart, and passing through two of the cavities of that organ, is pumped through an artery (the aorta) which immediately divides and is then split up into arteries which are distributed in infinitesimal divisions to every part of the body, terminating in fine tubes resembling those which ramify on the air cells, where a similar interchange takes place, which is reparative there being a deposit of new material and a removal of the effete; the worn out matter now tinges the blood with a deep red colour, which is taken up by the minute veins, which by combining increase in size and diminish in number until they terminate in the two main ones (anterior and posterior *venæ cavæ*) which enter the right side of the heart; the blood is pumped through the two divisions of that viscus into the artery going to the lungs (the pulmonary) on reaching which it is again distributed by ramifications on the air cells, and the circulation is complete.

The digestive organs of the camel, as in all ruminants, are complicated, but I will endeavour to give a familiar outline of them.

The food being gathered is rolled about by the tongue and masticated, to a certain extent, by the larger set of teeth, (the molars),

during the process being mixed with a proportion of saliva, and the fluid secreted from the lining membrane of the mouth itself called mucus, it is then thrown into the pouch at the top of the gullet named the pharynx, and from thence propelled down the gullet or oesophagus into the rumen or first stomach which is a large store for food at this stage of its passage; the rumen is a muscular membranous bag occupying a very large portion of the abdomen, it is divided into four compartments internally, and is lined by a continuation of the membrane covering the mouth and inside of the gullet but modified in character.

The remarkable peculiarity of this stomach in the camel which I wish to describe is, that appended to it are pouches arranged in two groups, right and left, the right being the larger, and each group disposed in parallel rows separated by strong muscular bundles, given off from a large band of fibres which commence at the entrance extremity of the rumen, and proceed in a longitudinal direction, dividing the entire cavity into two compartments. Muscular bundles of fibres are arranged transversely, and are otherwise distributed so as, when contracting, to close the square shaped mouths of the pouches.

This arrangement, all comparative physiologists agree, is a provision for the especial stowage of water, enabling the camel above all animals to tolerate on an *emergency* an abstinence from that fluid, but let the word emergency be remarked, for it has been mentioned that, although the animal is thus enabled to travel on a short supply, it does not follow that he is not better with his tanks frequently replenished; this interesting provision has been made much stock of by lecturers, and I am afraid in their enthusiasm, erroneous impressions have been conveyed; for instance, I recollect one who said that when he found the camel to possess *two extra stomachs* for the conveyance of water, the object of which was to supply him with refreshment during his passage through the desert, he could not help ejaculating, how wonderful!! and he went on to enlarge greatly upon the jealousy with which the supply was drawn upon, conveying the idea that it was only when the animal arrived at an extremity that these stomachs were opened, and, even then, but just sufficient quantity of water exuded to moisten the parched palate, for fear the store should be too soon exhausted.

True, these water pouches may be called extra stomachs but they are not large reservoirs, it is equally true that their muscular mouths prevent lavish expenditure, but we must not, in our enthusiastic admiration of nature's provision run away with the idea that camels are absolutely independent of frequent watering; it is a dangerous doctrine to adopt on a campaign, when we want by every means to economize the animal's strength, and draw as little as possible upon this reserve.

But to return to the ordinary course of the food; the rumen being filled with partially masticated food the animal usually lies down, experiences a sense of repletion, and, the contents being rolled about and mixed

with the fluid contained, are prepared to be passed into the second stomach (reticulum or honey-comb shaped) when pellet after pellet is separated and forced up the gullet into the mouth, this time to be more effectually masticated; this process is called "chewing the cud" and in the camel the food is ground *alternately* in opposite directions from side to side, in other ruminants this is not done so regularly.

After still further admixture with saliva, the importance of which fluid is too often over-looked, it passes again down the gullet, but in such a pulpy state as to glide along a passage to the third stomach, and pass by the entrances into the first and second; the third stomach is called the omasum or many-plies and has numbers of broad folds of lining membrane resembling leaves of a book, which are covered with numerous prominences or papillæ, between these the pabulum undergoes still further trituration and mucous admixture, and is then forced into the fourth stomach or abomasum, which is lined by a velvet-like membrane; here it meets with the gastric fluid, usually looked upon as the most active agent in digestion; it then passes on to the first small intestine, (Duodenum) the commencement of which forms a distinct pouch in the camel, where it is subjected to the action of yet two more juices, (bile from liver, and the pancreatic secretion) here the aliment becomes fit for the separation of blood material, which is taken up by certain glands, and conveyed into the circulation by means of a set of conduits named lacteals from the milk-like appearance of the fluid contained. The remaining mass is passed on through the smaller and large intestines, during which passage still further nutritious matter is selected from it, until ultimately, superfluities are expelled in the form of excrement, this being in the camel particularly rich in ammonia, as proved by sal ammoniac being prepared from it.

There are peculiarities in the anatomy of the liver, and some few specialities in the form of the pancreas, but it will be sufficient for our purpose to notice the *absence of the gall bladder* as an appendix to the former: this proves that, as in the horse, a continuous flow of bile is intended, and we consequently infer that digestion in both animals is a continuous and not an intermittent process, as is more or less the case with those that possess gall bladders: the horse thrives best when fed frequently in small quantities, why should not the camel be similarly treated? It is at the same time admitted that both *will* tolerate fasting for a considerable period and the existence of the rumen in camels is not forgotten. The kidneys are glandular bodies situated in the abdomen under the loins, they perform an excretory office, and it is to be particularly remarked that the urine of the camel corresponds with the dung in being rich in ammonia.

The skin of the camel has been observed by my friend Mr. Kettlewell, (V. S. Saharunpore stud) when placed under the microscope, to be deficient in perspiratory follicles and ducts.

One more anatomical provision remains to be noticed as pertinent to my subject, viz., the nervous distribution which maintains the sympathy of internal organs, and renders their action dependent on each other; this arrangement cannot be enlarged upon here, but my readers will please to remember there is what is called the Pneumo-Gastric system, which, as its name indicates, *connects intimately the respiratory and digestive functions.*

Evils on march.

Most of these admit of palliation, but it will be at first sight supposed, that the *nature of the road* in a strange country is irremediable; there are many instances however in which considerable saving to animal power may be effected, by judiciously regulating the length of march according to the severity or otherwise of the ground traversed and to effect this I do not think the importance of hills as impedimenta to camel progress can be over estimated; camels will travel over loose shingle with comparative impunity, but, the base of every acclivity in the Candahar route, bears, doubtless to this day, abundant testimony as to the trying nature of rising ground.

I remember many instances of loss of life by neglect of this precaution when a camping ground could have been easily arranged, notably in a march from Much to Darivaza in the Bolan pass, where scores of beasts succumbed at the foot of the final hill, whereas a rest at Sir-i-bolan might have husbanded their strength sufficiently to have enabled them to have surmounted the obstacle, after which it was comparative plain sailing to Quetta, where a day or two's rest might have revived thejaded.

Another very trying road is the slippery one, the camel is particularly, afraid of such, and his anxiety proportionately increases the amount of exertion, particularly when wet nullahs are met with, and many is the one that ended his life's journey at these.

Irregular, insufficient, and unsuitable food, I maintain to have been a fruitful source of loss which might have been avoided, but this will be considered under the head of "methods of avoiding diseases." Perseverance when the animal was obviously unfit for further exertion was a crying evil.

I saw camels loaded *standing* day after day, because they were unable from weakness to rise if the burden was imposed when lying down in the usual manner, the consequence in one instance being that the poor brute, literally worked to death, joined the melancholy party of corpses at the foot of the hill just alluded to; this *inability* was esteemed obstinacy by the Surwan, the stick was freely used, and, in the one instance, my knife was borrowed to cut a fresh slit in the nostril for insertion of the leading cord, in order that, by

such torture, the victim might be induced to travel a mile or two further; I little knew for what purpose the instrument was required.

Suffering from weather undoubtedly added to the list of casualties and was in many instances an unavoidable cause; at Abdulla Khan ka Killa camels laid for forty eight hours in melting snow amounting to a freezing mixture, no wonder at the stagnation of blood which produced congestion of the lungs and its consequences; I suggested that, they should be compelled to move about in order to restore circulation, but the Surwans could not be induced to make the necessary exertion which would, in all probability, have been equally beneficial to themselves; indeed the cruelty and neglect of these persons cannot be exaggerated too indifferent were they frequently even to procure food for their charge, unless it was absolutely brought to them. It was the general impression amongst the Officers of the expedition, that this indifference in a great measure arose from the idea of compensation being awarded for all animals lost after leaving Dadur; the Surwans considering it more to their advantage that the beasts should die, and so release them from further attendance. The imposition of undue loads was frequent, hardly any consideration of the capability of the animal being taken, and, not unfrequently these were increased by private stores of the attendants themselves, and the addition of their own weight to save the labour of walking. The load sanctioned by authority, *viz.*, five maunds or four hundred pounds did not appear to be too great for a healthy and matured camel.

The systematic way of investigating disease is first, if fatal, to ascertain by a *Post Mortem Examination* the organs involved and the nature of the lesions; we next look around for *predisposing* causes; thirdly *exciting* causes claim our attention. Having informed ourselves on these matters we consider the best *means of obviating* the malady in healthy animals; a matter of even greater importance than curing those already affected. I do not intend to intimate that we were powerless with regard to treatment of the sick, but the means supplied were very scanty, the most simple and necessary drugs were not to be had; if veterinary supervision had been provided surely this would not have been the case. On joining the 15th Hussars at Robart, two day's march above Candahar, I found the Regiment almost destitute of veterinary medicines and surgical means, they had been duly applied for, and as duly despatched by the Principal Veterinary Surgeon, but never reached us, although the invoice arrived punctually; these if sent to the head of a Department at Candahar, would, in all probability, not have miscarried, and he would have facilitated their being forwarded to the corps requiring them.

Post mortem examinations.

These revealed, in every case, that came under my notice, pulmonary disease in almost all its varieties; at *Quetta*, where the first

were made, *acute* congestion and inflammation of lungs were evidently the causes of death, and such was the case in all instances during the inclement weather on the way up to Candahar; on the homeward journey, when the atmosphere was more genial, it was the *chronic* results which proved fatal. These chronic affections may be familiarly understood by the term consumption, not that the subjects showed the true lesions of Phthisis, as it is medically called, but certainly corresponding with the more extended meaning of the word as, a wasting away. Dense deposits called tubercles were found; abscesses in the substance of the lungs named vomicæ; condensation producing a liver-like appearance denominated hepatization; many parasites of the order classed Hydatids; and the caseous degeneration of blood, constituting a kind of embolism, was here located.

An examination of the digestive organs certainly did not indicate structural derangement, but while the rumen was filled with ingesta, the second, third, and fourth stomachs together with the intestines, were remarkably empty, showing that the food had collected in the first stomach, but that general debility, and interference with natural functions, had prevented its being carried further on, for the purpose of being properly digested and prepared for assimilation. In one case only did I find that the liver participated, in that one however, tubercles existed which would be the result of disordered circulation.

The deductions to be drawn from the foregoing are, that the want of nutrition produced debility, and such deterioration of blood as to prevent the lungs, which it has been explained are so intimately associated with the circulation, performing their office properly, the result ultimately being, absolute disorganization of those organs themselves. In addition to this, the paralysed condition of the digestive organs had been sympathized with by the respiratory, as we have seen they are capable of doing through their connection by means of the Pneumo-gastric system of nerves.

Practically want of proper food, accompanied by exposure, so debilitated the camels as to predispose them to disease, and the severe cold together with trying changes of atmosphere excited disease of the lungs of an *acute* or quickly killing character; latterly the continued want of proper nutrition, although not associated with extreme exposure, induced *chronic* or more lingering disorder, which in many animals, although they were for a time equal to a certain amount of exertion, caused death when they were called upon for extra effort, and the rate of mortality amongst them, exactly corresponding to the length of the marches, confirms the idea.

Mr. Kettlewell suggests that the chronic disease of the lungs might be of a scorbutic (scurvy) character, the result of depurated and impure blood, through a deficiency of vegetable acids; a reference to the nature of scurvy in the human subject favours the notion; sailors,

when deprived of vegetables at sea are prone to scurvy, so may our camels from a similar deprivation in Afghanistan, have suffered.

One remarkable result of my post mortem investigation was, that the plural covering of the lungs and chest was in no instance involved; in most animals this membrane is nearly always included when the lungs themselves are attacked, and in this particular instance, where the chest was so especially exposed, it could hardly have been anticipated that it should have escaped; but such appears to be a peculiarity in the camel, for my personal observation was immediately endorsed, on my mentioning the fact to Mr. Kettlewell, who had himself noticed the apparent anomaly.

It will be gathered from the foregoing that disease of the lungs then, was pre-eminently the most fatal; that some died of Dysentery, which is known accompaniment of scurvy, I do not doubt, as I observed many camels during life much emaciated from that cause; and I have heard that in the northern army many succumbed to the premature birth of calves, an accident which we can perceive to be the result of debility, but I have stated the fact of our camels being, almost exclusively, males. Beyond sore backs, which were very frequent, and as frequently concealed by not removing the pilanes (saddles), other affections than those I have noticed were not conspicuous; I have referred to such meagre accounts of camel diseases as we possess, but find, that "Paypsay" (Pneumonia) and "Soolce," (Dysentery) were the greatest scourges during the Expedition. A dropsical affection "Zaharbad" I am informed is a frequent result of the debility produced by hardship and exposure, and was particularly prevalent during the siege of Delhi, but I can safely assert that it was not a prominent malady in Afghanistan.

Predisposing causes of diseases.

These may be very briefly noticed, attention merely being called to those embodied in this paper, such as a departure from ordinary habits in the way of feeding and attention, change of climate, continued exposure, and all the hardships inseparable from a campaign.

Exciting causes. Improper food; over work; bad quality of water; neglect in supplying water; direct cruelty. Both predisposing and exciting causes will necessarily be considered under the head of methods of obviating diseases.

Symptoms of the diseases mentioned.

Provided the opportunity occurs of invaliding an animal for a time and by treatment giving it a chance of recovery, it is of the greatest importance to recognise such symptoms as will indicate the first approach of disease. These in approaching pneumonia are such as indicate general debility and a feverish state of the system; the nostrils are dry and there is frequently an exudation of blood therefrom; the membrane lining the mouth is also dry and of very dark colour from congestion;

the animal is evidently languid, and hangs back, tightening the leading string in his nostril; there is an occasional cough; rumination will be suspended; appetite completely lost or partially impaired; constipation will accompany the other symptoms, or in some cases the reverse will be the case; the urine is of a dark colour, and has an increased ammoniacal odour; but there *will not* be perceptible respiratory difficulty or disturbance; neither, so far as my observation goes, is much information to be derived from auscultation (listening to the respiratory sounds by the application of ear to the chest); still less by percussion (or tapping the parieties of the chest); these three latter statements are most singular facts, difficult to theorise upon, but probably the Pneumogastric nerve again offers a solution of the mystery; I am informed that this nerve originates at a greater distance from the brain than in shorter necked animals, consequently, being less intimately connected with the nervous centre, the sympathy of the lungs with general nervous disturbance may be diminished.

The symptoms of Dysentery are again debility, accompanied by slimy evacuations from bowels, of a very fetid odour, the patient is restless, lying down and getting up frequently; urine scanty and high coloured; after a time blood is mixed with the slime; the appetite is lost; and emaciation ensues. When blood is mixed with the evacuations, the term "Peches" is applied.

Treatment of disease.

At the advent of either of the above diseases, rest and protection from cold are especially necessary, and the following are taken, from a publication on the diseases of camels, as appropriate medicines. In "pneumonia."

Henbane (Hyoscyamus)	...	...	Tolas	6
Dhatura seed	...	...	"	1
Turmeric	...	...	"	24
Mustard seed	...	...	"	24

Make into eighteen balls and give one, two or three times daily.

The appetite may be tempted by offering a variety of food frequently, and plain gram is often particularly relished.

In "Dysentery." A quart of castor oil ought to be given, and repeated once or oftener according to the appearance of the evacuations, continuing it when these are slimy. If the purging is not checked.

Opium	...	...	Tola	1
Hemp resin (Bang)	...	...	"	4
Turmeric	...	...	"	24

Divide into eight doses and give one every eight hours, until the purging diminishes. I cannot myself speak from experience of the efficacy of these medicines, but should think the prescription for Dysentery the most promising; possibly alum, four to eight tolas twice daily, might be of service.

Methods of obviating diseases.

Foremost amongst these decidedly stands a proper selection of animals for the duty, by due supervision at the point of starting; it will be remembered that at Quetta I found twenty-six out of seventy dead camels only two years old, these would have been at once rejected by an Inspector at Sukkur, and their lives saved, they were evidently unfitted for a campaign in consequence of juvenility; it is possible also that others might have been found absolutely unfit from want of the condition necessary, and so saved from going through the useless ordeal; some might have been, and probably were, diseased at starting.

Enforcement of duty on the part of the Surwans, their carelessness, cruelty, ignorance, and wilfull neglect were most conspicuous; surely some efficient means of discipline might be found with regard to them, so that we should not have had the animals fed at hap-hazard; not have allowed their prejudices to interfere with the camel, who, sometimes almost dying with thirst, attempted when crossing a stream, to take a draught of water but was dragged on by that painful peg and cord through the nostril; that we should not have had them refusing to move their charges about at Abdulla Khan instead of allowing them to lie and freeze for forty-eight hours; not have had the food sometimes withheld altogether.

That these men were too indifferent to report an invalid unable to carry a load: that they loaded indiscriminately; threw down the grain to a number at a time when the strongest ate too greedily, (as in one instance at Quetta when bhoosah had insinuated itself into the air tubes of the lungs and caused suffocation) and the weaker were robbed of their share; and that they were allowed to maltreat, (to murder would be the correct term) in order that they should get compensation, and, be themselves released from attendance, is notorious.

One Officer per Regiment detailed to see that such abuses were not permitted, and to look to the well being of these animals generally would take an interest in his work, and such an arrangement would be welcomed I know by *all* Commanding Officers, for is not the efficiency of their transport of paramount importance, was not the lack of it a constant source of anxiety in the Afghan Campaign, and are not some of our reverses at the Cape attributable to deficiency in this particular? That supervision *will* preserve these animals was abundantly proved, by the fact that few of the camels carrying the baggage of officers were lost because they found it so necessary to look after them themselves.

In making the suggestion of an officer being intrusted with this duty, it must not be understood that he requires special knowledge of the animals at first ; a well considered code of directions might be drawn up for his use, and a very little practice would make him an adept at detecting a failing camel, or a negligent Surwan.

If suggestions from those whose business it was to make the preservation of the health, and consequent efficiency, of transport animals their study, met with a little more consideration from the authorities possibly they might be an additional means of obviating loss ; I did not deserve a rude rebuff, by a General Officer when *doing my duty*, on the 23rd of March last at Bula Zai, by respectfully suggesting that the debilitated horses of the 15th Hussars should not be robbed of a portion of their grain for the use of camels, but rather that the grass-cutters should be employed in gathering herbage for them. I endeavoured to explain that the grain would remain useless in the insufficiently distended rumen, while the herbage would really promote digestion, and those who have read this paper will know my suggestion was founded on scientific grounds.

Some regulations as to feeding might be carried out, deficiency of *bulk* of food appeared to be too little noticed ; I have advocated feeding frequently, this might be done when opportunities occurred for repose, and a bait might be given at a halt when on the march, a provision that was totally neglected ; it is acknowledged that grain is better given in the dry state, especially if gram be split, and barley bruised ; a certain admixture of some bulky material, such as bhoosah is an advantage ; browsing should be allowed on every available opportunity.

Feeding after a long exhausting march, or after unavoidable prolonged abstinence would require special regulations ; it must be remembered that the stomach is principally muscular in its constitution and shares in the general weariness, it must therefore be given time to regain its energy, and a little distension with satisfying food would induce the repose necessary for a return of the vigour required for the more active operation of propelling a highly nutritious supply forward ; the latter, even if sent to the mouth for rumination, would there be premature, for the remaining two stomachs are, during exhaustion, deficient in digestive power, and the partially, prepared aliment would irritate the bowels.

With regard to water, it should not be given after a full feed, but is grateful even to the wearied organ, rapidly restores the normal fluidity of the blood which has been partially destroyed by abstinence, and, with the above exception, may be given whenever the animal feels inclined to drink it.

Cruelty in forcing camels to march on when obviously unfit has been alluded to, it was a fertile source of loss, many exhausted

ones might have recovered with a few days rest and feeding, and some that were left behind as dying, did revive; for this purpose certain stations, might be made available, although it is admitted that, in marching through a wild country, this is sometimes impossible; with a view however of resting the overwrought and supplying their places with those that had regained their strength, Depôts might be more frequent, and for this purpose all Transport Stations could be utilized. Proper selection for different localities is of great importance; plain camels did pretty well, on the way to Candahar, and as far as Dadur; the Bolan pass was most trying; the Kojuk almost equally so, though not so long; few fatal cases occurred amongst hill camels.

Colonel McCleod Commissary of ordnance, started from Sukkur with eight hundred camels and eighty mules, he arrived at Candahar with insufficient of the former to carry his ammunition (I think less than one hundred and fifty), seventy-six of the latter accompanied him the whole journey.

Fair summary of camels that might have been saved during the South Afghan expedition.

This is a delicate subject, which must be left to inference or reasonable speculation; we must remember that a proportion of more than *one-third* of the seventy dead camels at Quetta were only two years old, was there the same leaven of juveniles in all the batches which started from Sukkur during the earlier months? How many were killed by want of provision for proper feeding, when arrangements might have been made, had *some one* remembered that the ruminating stomachs require special accommodation? How many succumbed to unnecessary over-driving? How many were almost willfully killed by negligent Surwans? How many water stores, ever-lasting, as it has amused physiologists to call them, were allowed to run dry? I must repeat that Officer's camels enjoyed a considerable immunity from all these evils, and leave my readers to speculate, if it please them, as to the numbers that *might* have been saved.

RUSSIA AND THE EAST,
A COLLECTION OF
GEOGRAPHICAL AND POLITICAL ARTICLES
BY
M. VENIUKOFF,
ST. PETERSBURGH, 1877,
TRANSLATED FROM RUSSIAN BY
CAPTAIN W. E. GOWAN,
BENGAL STAFF CORPS.

PREFACE.

Into the composition of the present book there has entered a series of articles, which have already been printed in various periodical publications, viz: in the Magazine of State Knowledge "(Sbornik Gosydarstvennikh Znaniy); in the Russian Messenger "(Russkii Vaystnik), and in the Military Magazine "(Voyenny Sbornik). Here these articles appear to some extent corrected in conformity with the march of circumstances or the observation of criticism. They are all dedicated to the East, and in the composition of all, one thought alone has guided me to aid in the elucidation of that position which Russia occupies in Asia. In this sense I ask pardon of the reader for the too pretending title of the book—"Russia and the East." Perhaps, in time, another part of this compendium will appear, which may in some degree justify this title by reason of its many sidedness and systematical composition. May this pamphlet now be regarded as a simple continuation and amplification of my "Attempt at a Military Review of the Russian Frontiers in Asia."

M. VENIUKOFF.

June 1877.

IV.

PROGRESSIVE ADVANCE OF RUSSIA IN CENTRAL ASIA.

TRANSLATED FROM RUSSIAN

BY

CAPTAIN W. E. GOWAN,

General List Infantry.

In universal history, especially in the chronicles of the East, few events will be found of such deep importance as the progressive advance of Russia in Central Asia, for it has taken place in the course of the last two centuries and of course is not fully completed. From the point of view alone of the physical history of man this advance must be termed the re-establishment or the enlargement of the dominion of the Aryan race in countries which were for a long time under the power of peoples of a Turki or Mongolian origin. In an economical sense it presents itself as the natural installation of the general demands of existence and in the application of European ways of life to the improvement of people in countries where a thousand years have passed without a change from the completely Asiatic arrest of manners and of the progress of trade.

Further, as regards morals, legislation and religion, it is a new step towards the spread of the power of Christianity towards the substitution of humane principles for the elements of Mussulman fanaticism and consequently towards the freeing of the personality of man from complete annihilation by the severe demands of Islam.

For science and for the civilization of mankind the Russian advance has opened not only a new, not only an explored region, but has established a durable foundation for the development of general information amongst peoples until now completely ignorant. In the light too of civic order, the peoples of Central Asia can henceforth consider themselves in the stage of the same connections with advanced nations as the Caucasian races, entered in the beginning of our century and into which the Hindoos were admitted at the end of the preceding one.

Lastly in a political sense our successes in Central Asia are likewise important; for Russia herself, as the gradual bringing of her

into the region of natural boundaries very advantageous to her ; for Asia, as the crowning of the subjection of almost the half of her power to a single nation, and for humanity generally, as the advance of one powerful, European nation to meet another which has already possessed itself of the richest countries of the East but which has fears for the loss in them of her own dominion.

We will endeavour here to explain the chief deducible facts by which this Russian advance has been accompanied in all the enumerated relations.

It is known that contemporary anthropology and comparative philology assign as the birth place of the Aryan or the Indo European peoples the Mountain Countries along the upper course of the Indus and of the Oxus. From this quarter our Aryan Ancestors were spread on the one hand to the South, towards Hindostan whence they drove back the Tamils, and on the other, to the north west towards Persia, the Caucasus and Europe where, thanks to the extraordinary favorable conditions of this part of the world they received an unusually high industrial and intellectual development.

If now we begin to trace the settlement of peoples in the countries named we shall see that, beginning from the limits of Kashmir, we can pass through Dardistan, Chitral, Badakshan, Balkh, Herat, Persia, the Caucasus, Southern Russia, Austria, Italy, Southern France and Spain to the most western limits of the Old World without stepping out of the region of the Aryan race. But another and altogether different race is presented to our view if in our movement towards the west we take a road more to the South or more to the north of the Caspian Sea. There, after passing the Dards, Wakhanians, Gattchis and Tadjicks who occupy a comparatively small space in the mountains of Upper Asia, we shall move for a long time through lands inhabited by Mongol Turkish peoples, be they Uzbeks or Kirghiz and only on the banks of the Ural shall we again meet with an Indo European race and even there it will be mixed.

Moreover the route to the north of the Caspian Sea is perfectly open, that is, it is not shut in by mountains like those of the Caucasus, nor by water systems like the Black Sea and the Archipelago. It was too the main road taken by the Aryans in their movements towards Western Europe and if we now indeed find an interruption thereon it is because historical events have brought such about.

The Mongol Turkish races, who descended from the great highlands of Eastern Asia into Central Asian countries drove out thence the original inhabitants, either altogether, or in part, and began to possess themselves of the soil from the banks of the Obi and the Irtysh up to Khorassan, the Hindoo Kush and the Himalayas.

This is not the place to see how this movement was accomplished. It will be sufficient to bear in mind that it extended

over many centuries, that it dated from the epoch of the great migration of peoples prior to the conquests of Chengiz Khan and that it has been continued in the movements of Nomad races during the last and even the present century. But for us this fact is important that between the Aryan mountaineers of the Hindoo Kush and of the Pamir on the one side and the inhabitants of the banks of the Ural and of the Irtysh on the other, *i. e.* where previous to the commencement of the 19th Century there was absolutely no bond of unity between the various members of the Aryan family there has now appeared an ethnographical chain of union, nay more, the deficiency has been supplied by the Russians *i. e.*, by a nation which rules in a political and intellectual sense over its weaker brethren. And although the disparity between Russians and Tadjicks, Kafirs, Siyaposh, Dards &c., is great, but one glance at the dictionaries of the latter races compiled by the English travellers Burnes, Cunningham, Drew and Leitner will show us that we have there met with kindred races to whom a similarity of countenance (more than a common origin) and even certain historical traditions draw us near. Greek civilization, as is known, reached the upper Oxus some 1,200 years before the establishment of the Russian monarchy and the contemporary rulers of Darvaz, Shignan and Wakhan boast of their descent from Alexander the Great. From the Greeks too of another epoch we also received many of the conceptions of social life.

What real ethnographical signification this "return" of a portion of the Slavs into the neighbourhood of their truly historical birth-place will have it is now difficult to say. It is very probable that religious differences will interfere with the formation in Turkestan of a numerous and mixed Aryo-Russian race. But this much is important that henceforth the indigenous Aryan of Central Asia will pass from under the subjection to the Mongol Uzbeks and that before them will open out a better future. If their race has not lost the noblest qualities of the White stock they must yet play in history a not unimportant role.

We must not moreover forget that race differences exist even betwixt those who have long lived with the Tadjicks and Uzbeks and those races themselves have not in any wise been wiped out, that the former still hate the latter, and that intermarriages amongst them are still very rare. The Aryan aborigines are moreover more susceptible to improvement and are more intellectually developed than are the Uzbeks, a fact which has been well demonstrated by Grebenik, one of the best and most practical authorities on Central Asia. Arrangements should be so made that this difference betwixt races should be made to work to our national interests and to the interests generally of civilization. Much can be done to facilitate the difficult problem imposed on Russia, in Central Asia. And it must be regretfully acknowledged that up till now nothing has been done by us in this direction. There does not even exist a dictionary of the Tadjick dialects, nor has one of the Russian Savants who have visited Turkestan put himself to the trouble to trace out the degrees of Kinship betwixt the Aryan portion of the inhabitants and the Slav and Lithuanian branches.

No one has raised the question as to whether it would be open to Russian Settlers who had by degrees penetrated into Central Asia and who were in no way forbidden by Canonical laws or by strict ideas, to form marriage ties with the aborigines and so add to the possibility of establishing a body of youth who would be inured to military service in Turkestan and a condition of such alliances of course being that at the end of their service they should settle down with their families and by degrees call forth, it may be, such a superior race of people as we meet with on the banks of the Terek where for a long time Russian Cossacks have married the daughters of Caucasian Mountaineers. We are not Englishmen who in India use every endeavour not to amalgamate with the native population and who therefore will, sooner or later, pay for the circumstances by the loss of a country in which they will have formed no ties of Kinship. Our strength, on the contrary, has hitherto consisted in this, that we assimilate ourselves to the conquered races and enter into friendly relations with them. It is to be desired that this historical result should not be forgotten in the future, especially as we advance upon the upper course of the Amu Darya where we must establish a thoroughly Russian borderline as the essential guarantee for the solidity of our situation in Turkestan.

As for the rest let us place on one side our conjectures as to the future ethnographical physiognomy of Central Asia and let us examine what we have already done for the consolidation of our great race superiority in this vast country.

Up to the 20th year of our era Russians had not established themselves at all beyond the Ural and the Irtysh and therefore the then subjection of the Kirghiz to us, who had nominally been subdued from the year 1732, was almost at an end. By degrees however colonistic movements in the steppe had set in and have now attained to considerable results. An entire line of Russian settlements had been established on the steppe and also in the recently conquered and settled portions of Turkestan. These Russian settlements can be brought under three principal heads, steppe fortified posts, Cossack and peasant agricultural Colonies, and trade centres in certain towns peopled by the aborigines. Of the importance of the first there is almost nothing to say.

Under favorable circumstances the importance of fortified posts has been preserved only for the space of a few years during which one or other of them has served as a base of operations. As a rule these steppe fortified posts have been simple "Etapes" or advanced stations, the establishment of which have depended on temporary military requirements and the maintainance of which have principally interested their founders or the contractors for the supply of their garrisons. In our time, that is after the subjection to the power or influence of Russia of Kokand, Khiva and Bokhara itself, many of these fortified posts as for instance, Masshe, Uilsk, Karabutak &c., have lost all their

importance, and why they still exist we do not know, probably they will by degrees be vacated in order to obviate fruitless expenditure of money, or perhaps, even a pernicious influence on the fate of their occupants. Whether soldiers or the neighbouring natives, the Kirghiz who are systematically withdrawn from them, lest they should serve as victims of the subordinate military leaders.

Another class of Russian settlements, the Cossack and peasant villages, is, without doubt most useful in consolidating the Russian power in Central Asia and in initiating the people into the interests of a peaceful and civilized life. In those instances in which a selection of places for such settlements was made with due regard to the features of the country and the economical demands of the native population, they formed real centres for the civilization of the nomads.

Such were Vyernie, Akmolli and Kar Karalli. But there were of course occasions, and these were not unfrequent, when the Russian settlers on arrival, not only did not give an impetus to local manufactures and trade but, on the contrary, impeded both. Thus for example the establishment of Ayaguz compelled the traders, who were in the habit of accompanying the Caravans from Tchugutchek to Kar Karalli, to change their route so as to avoid this Russian settlement, and when the local authorities, in order to remove this inconvenience, transferred a Colony to the new road, the merchants went back to their old route.

A still more unsuccessful example of Russian Colonization in the steppes is afforded by the peopling, in the year 1840, of the Eastern or Trans Ural portion of what is now the province of Orenburgh. Here the Cossack settler deprived the Kirghiz of many of their best camps and yet they themselves have become so poor that now, the best thing for them to do, would be to form a new settlement somewhere to the South in the fertile districts of Turkestan.

The average number of Cossack agriculturists in the free steppe districts of the Ural, Turgaisk, Akmolinsk, Semipalatinsk and Semiratchensk has now reached to 505,000 souls, but in the steppes proper, across the Ural and the Irtysh, on an extent of country embracing 40,000 square miles, there are not more than 60,000 homes and these are very unevenly distributed. By far the most dense Cossack population is met with to the north of these steppes in the neighbourhood of Islimi and Tobol. In one place only, to the South viz., in the Trans Ili country is there seen a similar attempt at concentration although the number of Cossacks here is not very large either; on the remaining extent of steppe lands, especially in the Orenburgh jurisdiction, Cossack settlements hardly exist.

Such is the condition of this military agricultural class, the historical vocations of which require that it should be always ready

to guard the frontiers of the Empire, that it now exists far from these borders and continues to move to them for service after traversing many hundreds and even thousands of versts*. This shows that the question of the Central Asian Cossack system of colonization must sooner or later be submitted to investigation in Government Circles, and it is very possible that the portion of the Cossacks who are furthest from the frontiers will be admitted to a civil Status whilst another part is moved to the South. This at least would be rational both from a military-political as well as from a state and economic point of view.

Free agricultural colonies *i.e.* of peasants, throughout the whole of the Russian possessions in Central Asia are still very inconsiderable. They are for the most part spread in the provinces of Semiratchensk.

They might be placed in a condition to establish themselves in the Delta of the Sir if some method of irrigating the Murzarabatsk steppe could be devised. The same remark applies to the Kulja district if it were to be finally declared Russian territory. As concerning these mercantile and manufacturing outskirts or the Russian Wards in Tashkent, Samarkand and certain other localities, however quickly these colonies may have developed themselves they do not up to the present give the idea of any thing desirable or solid. In the event of any political failure on the part of Russia in central Asia they would as quickly disappear because their inhabitants are of a transient, casual and fortuitous order. In Tashkent a costly attempt was made to consolidate there the newly arrived Russian element by exempting Russians from various taxes and by subsidizing Russian householders. But the results proved to be thoroughly unsatisfactory because the houses built for the officials were frequently sold, on the departure of the builder from Tashkent to local Sarts. And it may be said that the introduction into towns of a newly conquered country of officials and merchants only, cannot serve as a sure pledge in the annexation of that country. Were it otherwise England would have no cause to fear for her supremacy in India.

Thus after briefly surveying the Russian settlements in Central Asia we see that their number is limited and that consequently the race supremacy of the Russians over the natives is still far off. Nay we may even suppose that such a numerical supremacy will never be attained, because of available land, suitable for culture, there is almost none.†

There is still cause for regret that this supremacy has not been gained in another way. We mean by the transfer from afar of Russian colonists and by the gradual and peaceful replacing of a portion of the native

* From Ornsk to Tashkent is 2,400 versts, and to Kokand 2,600. From the upper Ural to Samar Kand is 2,300 versts and to Petro Alexandrovsk 1800 (A verst is $\frac{1}{3}$ of an English mile.)

† It would however, be possible to, in some degree, create such land along the Sir Darya by diverting a portion of the waters of that river into irrigating canals.

population by a mixed Russian element. This, as we have observed, could be done by introducing youths, who after becoming inured to service in Central Asia, might be willing to marry Mussulman women and to remain for ever in the country. In this way the scanty percentage of the Russian element which now scarcely reaches the following figures would gradually be altered. In the Semriatchensk district 5% in the Sir. Darya and Fergana districts 2% and in the Samarkand and Amu Darya divisions to 1-5th%.

Whilst acknowledging the not completely satisfactory features of the present Russian colonial system in Central Asia judged by the number of the colonists and the condition of the settlements, we must not however forget that even this small number, thanks to its high culture, can exercise, and certainly does exercise a strong influence on the reformation of the entire country, if not in an ethnographical at least in an economic and political sense. Let us begin our observations by looking at the economic side. Prior to the arrival of the Russians on the Kirghiz steppe the native population gravitated much more towards Bokhara Kokand and Khiva, than to the neighbouring portion of Russia.

Almost all the trade of the steppe was found in the hands of Sarts from Bokhara and Tashkent. The Kirghiz sold them, their cattle, also wool and hides, and they received in return articles of apparel, utensils of kinds, Saddles, Carpets and whatever was necessary for their scanty wants.

Even Russian wares from Orenburgh, Troitsk and Petropavlook, passed to the steppes and even further into Turkestan through the medium of those Central Asian merchants who became in this way monopolists of the market in which Russia, by reason of her position, should be supreme. The establishment of certain Russian advanced posts as for instance Bayan, Aul, Akundla, Kopal, and Vyerni put an end to this state of things in the steppe countries of Central Asia. Russian traders now penetrated into the heart of the steppe country and entered into direct communications with the Kirghiz whose economic dependence on Russia by this means was increased to the detriment of their relations with the Central Asian Khanates.

Another important economic result of the introduction of Russian Colonists to the Kirghiz was the establishment amongst the latter of a demand for grain and the diffusion at the same time of a taste for agriculture as far as that was possible in the dry and little watered wastes. All persons who are acquainted with the mode of life of nomads justly observe that in proportion as they become accustomed to bread so does their dependence on neighbouring settlers become secured.

We do not wish to say that in our time the whole Kirghiz race has learnt to consider bread as an article of the first importance, still a considerable number of advanced, that is of opulent and to a certain extent civilized Kirghiz live on bread and even sow grains such as

millet, wheat and barley. In the Koktchetavsk district, the Sultan Valikhanoff, in the Semipalatinsk district the Sultan Bukash and many others, afford convincing proofs of how an exclusively nomad mode of life is being given up amongst those of the native races, who, whether settlers or semi-settlers, have, from time immemorial, despised agricultural labours. These two important results attending the advent of the Russians into the steppes of Central Asia seem to us a sufficient guarantee for a peaceful future for the nomads, in striking contrast to their troubled past.

If by reason of the narrow limits of this article we are hindered from going into minute details we could adduce many data illustrating the successes of Agriculture throughout the whole of Central Asia wherever the Russian power has penetrated. But we will confine ourselves to an indication of the "Turkestan Annual" in which are produced some very curious particulars regarding the agriculture in the neighbourhood of Perovsk and of Semiratchensk which has been introduced and which has spread only from the date of the arrival of the Russians in these localities. It is sufficient to state that in these two places not only are the Kirghiz dependent on the local bread supply but a portion of it goes to victual the army and the inhabitants of the towns. In the province of Akmolinsk agriculture has so spread that many Kirghiz lay in a stock of hay for the winter and do not limit themselves to the transport of articles of produce by pack animals but bring "telegas" into use like the Russians.

In the highlands of Turkestan which have a tolerably dense population of settlers the consolidation of Russian rule could not really produce any radical revolution in the agricultural system which has there been maintained from of old, which is adapted to the soil and climate and which is bounded by those oases at the foot of the hills that are watered by rivers.

But if the general out-turn of the local agricultural produce has not altered much, the quality produced has changed a good deal for the better.

Thus for example has it happened in the case of cotton and wheat, the first of which is required for export to Russia* and the second for the supply of the army. The rearing of silk worms regarding which M. Petrofsk has collected some interesting details has been attended also with a certain amount of success since the introduction of an improved system of winding. To arrive at this end the following Russians have been the principal workers, Khludoff Pervushin, Dolgoruki, Raevski. The local vines in the province of Sir-Darya have begun to yield wine in addition to raisins; this, of course, is at present inferior but it has nevertheless to some extent taken the place of the expensive wines imported from Europe.

* It is much to be desired that Central Asian cotton should be brought into general use in the manufacture of local fabrics. And since coal has been discovered in various parts of Turkestan there are no special obstacles in the way of opening mills except perhaps, the want of skilled mechanics.

Cattle breeding, the most important branch of husbandry amongst the Nomad races of Central Asia has not since the arrival of the Russians in the country improved much. Still it has not remained stationary. Some of the Kirghiz have begun to construct covered cattle pens for the protection of their cattle during the winter snow storms. This was not so before, since the cattle of the steppes used to pass the winter in the open and obtained their food by scratching out the dry grass from under the snow.

Not long ago an attempt was even made to establish, near Tashkent, a stud for the improvement of the native breed of horses. Up till now however, this experiment has not been very successful; that it is expensive and poor in results is no doubt due to the fact that the business is not in the hands of one manager but of a whole Committee of Officials who carry out their arrangements at the expense of the State. Much more might be done than by this and similar specimens of "Exemplary" State supervision on behalf of Central Asian cattle breeding by simple pacification of the steppe. Such would put down the pillaging and lifting of cattle by malignant predatory neighbours. This cattle lifting now goes on only in those parts adjoining the Russian frontier saving the very rare instances which occur on the steppe itself.

With regard to the discovery and development of the mineral wealth of Central Asia the Russian advance in this country has led to very considerable results. In the Province of Semipalatinsk copper mines have been opened and layers of graphite, coal, lead and even of Gold have been found. In the Province of Sir Darya some layers of anthracite have already been laid open and fuel has thereby been supplied to steamers and to private houses in lieu of the wood of the "Saksaul" and other fruit bearing trees.

In the district of Kuldja the anthracite beds which were discovered by the Chinese are now being worked to meet all requirements. In the province of Fergana, Russian traders had found naphtha even before that country was annexed to Russia. In Trans Caspian territory, in the neighbourhood of Krasnovodsk or rather on the island of Tcheleken, naphtha is now procured to the great benefit of Krasnovodsk itself which now receives from this source a cheap material for lighting and heating purposes. This is the more important since fresh water is only obtainable there by condensing salt water.

Coal has also been found by the Russians in Mangishlak where experiments have been made to ascertain its heating powers for steamers. The trial has not, however, been hitherto successful still there is hope that sooner or later this Coal will be found to answer. Lead, the supply of which in Russia is so limited, is being worked in the Kara-tau mountains. Iron ores, although known to exist in many places, have only remained untouched because their working requires a large quantity of fuel, many hands, much expenditure of

capital and cheap communications for the export and sale of the finished metal. None of these are as yet present in Central Asia.

Indeed the presence of rich veins of iron in the Ural really interferes with the starting of workings of the same metal in the steppe.

The fundamental causes of the failure of the iron trade are to be traced to the mining operations. These are very imperfectly developed in all the Central Asian possessions of Russia notwithstanding that the Russians do not adhere to the same narrow system which the English have adopted in hampering the native produce of India so as to extend the market for Manchester and other thoroughly English goods.

Of great manufactures, in the European sense of the word, there are absolutely none in Central Asia. The tallow boiling, leather dressing and wine distilling operations in some portions of the Steppe, especially on the Orenburgh-Siberian line, serve to draw a few of the local raw products to the manufacturing industries.

The wine distilling works in Vyerni and Tepsa have so far developed as to keep ahead of the moderate demand which has arisen for this kind of produce, but of course until about a third of the income which the Russian treasury receives from the excise of spirit is remitted one cannot expect that the vexations inimical to the produce will cease.

In Turkestan the native settlers have for a long time been acquainted with various handicrafts, especially weaving silk and paper making, but these industries have not progressed and their out-turn is inferior both as to quantity and quality. The produce is fit only for Asiatics and but little suitable for export to European Russia.

We therefore see Central Asian Carpets and Silk webs but seldom, and other industries we do not see all. Furthermore, the increasing export of cotton and silk from Tashkent to the manufacturing provinces of Central Russia distinctly shows that on the local manufacturing industries for the working of the most important productions of Central Asia no one even counts, preferring to despatch raw goods 2,500 versts, so that they be well worked up, rather than consign them to the manual appliances of the Sarts. We may observe that such a condition of the cotton industry presents an economic phase which is very strange since all the Russian soldiers in Turkestan (and there are 37,000 of them) must by law wear linen made from Cotton, woven by local industry, so that a large manufactory for the out-turn of coarse calico would have in Tashkent a ready sale for its produce. Meanwhile such a manufactory does not exist.

With regard to the trade to Central Asia we cannot give any sort of numerical date showing the progress made by it since the establishment of Russian rule in this country. After the abolition in the year 1866 of the Orenburgh-Siberian customs line this trade disappeared from

Statistics, those little to be depended on figures of export and import of Central Asian trade which were formerly published by the minister of Finance.

The particulars afforded by the "Turkestan Gazette" relating to trade in Tashkent do not even embrace all the transfers of this City alone, to say nothing of the rest of Turkestan and of the Kirghiz Steppes. But that the trade of Russia with Central Asia and the local trade itself have grown, especially within the last 10 or 15 years, there is no sort of doubt.

The extension alone of such towns as Vyerni and Russian Tashkent testify as eloquently to this fact as the most minute statistical table could do. Especially striking too, is it that this trade has from the first been actively in our favour. By which it is meant that it has gradually passed into the hands of the Russian merchants, who have settled in Turkestan and in various parts of the steppe. Unfortunately the most recent intelligence from the Province of Sir Darya, places it beyond doubt that in this vast but sparsely populated province this active trade has once more begun to grow slack or to pass into the hands of the Sarts. Consequently Russian firms have either begun to reduce their returns or to depart altogether, from the scene. So too in Vyreni the most important commercial rôle now belongs, not to Russian but to Sarts and Chinese, the last of whom came there but a few years back from Kuldja. On the Eastern confines of the Province of Semipalatinsk, where 20 years ago trade had attained to considerable dimensions,* now it has greatly fallen off in consequence of the loss of power of the Chinese over the most considerable portions of Djungaria and along the road trading thence to China proper.

It is doubtful indeed if this trade ever could become vast because between China proper and European Russia there has already been established, for goods, a quick and cheap steam sea route. The Central Asian possessions of both powers, especially of Ghuia, are too poor by nature to admit of the interchange from them of many articles of produce.

When the mercantile scientific expedition for the exploration of a commercial route from Chankoi to Semipalatinsk set out in the year 1874-75, notwithstanding the desire of certain of its members to represent this route in an attractive light, the truth, long before known, was in fact more clearly shown that the time for great Caravan steppe routes had passed away and that if there did not exist more trade manufacturing monopolies of the order of Kiyakhtinsk (up to the year 1861) there was not even a hope that the sea route from Shanghan to Odessa could be replaced by a land route from Chankoi to Perm, a land route, that is, extending over from 5 to 6,000 versts, 2400, of which must be

* Through Chugchak there passed into Russia tea to the amount of one million roubles. In this City also there was found a sale for certain Russian goods.

traversed by pack animals. The very despatch of Caravans from the Zaisansk post into Djungaria was not effected without the utmost efforts and protection of the local authorities, involving the appointment of costly armed parties to protect the Caravans. This shows that commercial operations there rest on very unstable foundations..

With respect to the trade in the Trans Caspian country, the development of which was the official aim in founding Krasnovodsk we have nothing more to say than that in reality it does not exist at all, and of course never can exist, and this because the Turkomans have nothing to sell. As for the trade of Khiva, Bokhara and the high lands of the Amu Darya there are many routes more favourable for it than the sand driven, depopulated and waterless steppes which extend 600 1000 and even 1500 versts to the East of Krasnovodsk.

In our society rumours are not unfrequently heard to the effect that a change is about to be made in the flow of the waters of the Amu Darya, viz., that these waters are to be turned from the Sea of Aral to the Caspian Sea so as to completely alter the whole trade destiny of Turkomania and the Eastern shores of the Caspian. But this is a pure mistake. The diversion of the waters of the Oxus into the Uzboi Lake in sufficient quantity to admit of their reaching the Caspian, at the same time watering the valley en route, would of course re-animate that valley, but not otherwise than by bringing about the destruction of what is now the delta of the Amu Darya, besides which there is no fruitful soil of more than 100 square miles in extent; besides this with the diversion of the waters of the Amu Darya from it, at least half of the dimension of the Sea of Aral would be reduced and consequently steam communication between the basins of the Jaxartes and Oxus would be lost.

The results of the trade relations between Krasnovodsk and Khiva, the successes of these relations are usually spoken of as something of economic importance, are in reality so modest that from this fact we cannot but recognize the present decline of this trade and conclude that in the future there will be nothing heard of its greatness.

The one mournful picture of Krasnovodsk, that which was faithfully portrayed in 1875 by M. Grimm, should act on the most prejudicial understanding. If however we regard this aspect of the case we nevertheless cannot do otherwise than here mention, and with gratitude, the persevering activity of the Olukhopki in opening a caravan route between Khiva and Krasnovodsk. In doing this we should value, not the dimensions of the discovered trade movement but its political results, the establishment of friendly communications between the Russians and the Turkomans.

Before concluding our rapid sketch of the development of Central Asian trade which of course we must consider one of the best leaders of Russian influence and of Russian civilization into Turania and the

countries adjacent to it, let us say something of our relations with Kashgar, Korassan and other places. We will then follow out some general conclusions from the present development of the Russo-Asiatic trade movement and from those treaties with the Central Asian Khanates which should by their very existence in some way forecast the character and extent of Russian progress in this respect in the future. But trade with Kashgar is very inconsiderable and almost completely casual.

Nevertheless thanks to the want of success of the English, our rivals in that quarter, it has not been altogether profitless.*

In Khorassan there is not a single representative of the Russian trading community, although Russian goods penetrate there and even to Afghanistan through Astrabad. A like absence of Russian merchants is perceived too on the upper Oxus, in Khiva and in Bokhara itself where of fixed Russian firms there are but one or two. In all probability our mercantile treaties with Kashgar (1872) Bokhara (1868 and 1873) and Khiva (1873) were contracted in order to change for the better the not very satisfactory progress of Russian commercial operations in order, that is, to positively assert for Russian trade its primary importance in Central Asia.

By the treaties spoken of, the Russian merchants in these Khanates were placed on the same footing with regard to rights as the natives; without doubt it was this desire to extend the Russian market in Central Asia which induced the prohibition against the importation into Russian Turkestan of English goods from India. But neither treaties nor the prohibitive system have yet led to peculiarly important results. Of course one of the chief reasons of this is the want of Russian capitalists. But apart from that fact there are other difficulties: the competition of the Sarts who have been long and well acquainted with the requirements of the Central Asiatics and who possess everywhere an old established bond of union; then again there is the disturbed condition of certain steppe districts through which the trade routes pass: but the chief difficulty consists in the length of these roads and the necessity for everywhere transporting goods on pack animals.

All this raises the price of goods to an extraordinary extent and, not unfrequently, places them altogether beyond the means of the not very rich inhabitants of Central Asia.

This inaptitude of the Central Asian road communications, which is still more apparent in a strategic sense, long ago led to the notion of coupling Russia with Turkestan by means of a railway. A whole series of articles and journals and separate brochures have amongst ourselves and even abroad been dedicated to the question of this railway

*An account of this is given by the Agent of the Central Asian Company which has been established in India.

Learned societies* too have occupied themselves with the subject and lastly our own Government has decided to carry out detailed investigations with reference to the construction of a line of rail to Tashkent. It would be premature at the present moment to form any sort of definite and settled conclusion as to this future Central Asian trade artery, but here is what presents itself to the understanding when we regard this question in all its entirety as something which pertains to the sphere of science. Nature has herself united the number of directions through which a line of rail to Central Asia could pass, since the greater part of this vast country is taken up with fruitless and waterless steppes. Now a railroad could only be taken through oases, that is through tracts where population and culture exist or at any rate a line of rail could only be constructed to connect such oases by the shortest possible route. Thus a choice of directions both as to the present and to the future can only be amidst the following routes.

1 From the South East coast of the Caspian to Herat and thence to the highlands of the Oxus: from Herat also a line might be made subsequently to the lower course of the Indus.

2 From Krasnovodsk to Khiva at the point where water communications begin, on the one side, upwards and along the Oxus, as far as the confines of Hissar and Balkh; and on the other down the lower course of the same river; through the Sea of Aral and beyond to the mouth of the Sir Darya, which is navigable almost as far as Khodjent.

3 From Orenburg the ancient centre of the Central Asian trade and administration, to Tashkent across the steppe: the most favourable direction for this line is for the present a matter of dispute.

4 From Catharineburg through Troitsk to Tashkent.

5 From Semipalatinsk to Vyerni and thence to Tashkent and beyond. From Tumen a there is water communication as far as Semipalatinsk.

Let us now trace in a few words the characteristics of all these routes.

The first is represented as the only one of the Russian routes by which at some time or another India will be bound not only to Russia but also to Western Europe. This route above all, of all the five directions for a Central Asian railway therefore can receive international and universal importance.

Besides which by this route only, will a railroad be kept everywhere within tracts possessed of a settled population and almost as rich by nature as Trans-Caucasia, Gilan, Mazanderan, Herat &c.

* The Russian geographical Society; the Society for aiding the development of trade; the Paris geographical Congress.

The entire extent of the railway from Tiflis to Kunduz would be about 3,400 Versts and about the same distance separates Tiflis (sic) Kunduz (?) from Shikarpur on the Indus. In the construction of this line not only would the Russians be interested, for whom it would connect their natural Southern borders in Central Asia with European Russia but also Persians, Afghans, Hindoos and even the English (that is if their long standing prejudice against Russia were to become so far weakened as to induce them to travel to India through Russian territory). But it is evident that this line, which we will call the Khorassan, has no sort of likelihood of being completed either in the present or in the near future.

For Russia herself (that is for her interior communications) it would moreover have but a secondary importance by reason of its distance from the Seat of Government.

The second direction, the Krasnovodsk-Khivan, is tempting by reason of its shortness, viz., 650 versts. Further, by making this line, the trade might for a long time be confined to the navigation of the rivers AmuDarya and Sir Darya without going to any additional expense in continuing the line of rail beyond. Again in this region the winter is shorter, and the winter storms less dangerous than on all the routes which lead from the Ural and the Irtysh. But in this direction there is no population at all and it would be only possible to introduce settlers in small numbers about SaraKamish to which neighbourhood it might be practicable to divert some of the waters of the Oxus without taking away from the navigable properties of that river in the direction of the Aral. Finally this line would directly connect neither Tashkent nor Kokand nor Samarkand and their respective neighbourhoods with Russia. In the case of the places named, the more natural but more expensive pack routes to Orenburgh and Troitsk must always continue to exist.

The direction of the 3rd line, from Orenburg to Tashkent has not yet been finally demonstrated. But it is very possible that a line on Orsk, Urkatch and Julek, would be selected rather than the shorter distance from Orenburg to the banks of at the Sir Darya at Kazalinsk. But as Russia is in want of money it would be more practical to carry the road in the latter direction since in place of 2020 versts the length of the route via Orsk, or but 980 would have to be constructed, especially if the line were to be taken from Orenburgh along the Ilek to Ak-tiube. If absolutely necessary on financial grounds the line might for a time terminate at Ak-tiube which is distant from Kazala (or Kazalinsk) 650 versts. But the indispensable condition of the introduction of this, the cheapest (after the Krasnovodsk-Khivan) line to Central Asia, would be the maintenance and development of steam communication on the Sir Darya. This, as is known, has not up till now been fully attained. Therefore we observe that if on account of the impracticability of the steam communications of the Sir Darya and of the difficulties in crossing the sands of Kara-Korum it is not yet

possible to construct a line of railway from Orenburgh to Kazalinsk, it would be better to select as the point of departure in an Easterly direction not Orenburg but Catharineburgh or Troitsk, whence considerable quantities of metals would pass into Central Asia and whither salt, hides and tallow from the steppe, and cotton from Tashkent would, as now, be conveyed. It might too be possible to ultimately connect both Orenburg and Troitsk lines somewhere about Urkatch where a considerable amount of salt is obtainable. But all this, would extend the dimensions of the steppe net-work of railways to 2,600 Versts and require for its realization a vast capital, amounting, approximately, to 250 millions of roubles.

For to suppose the cost of construction of a single verst of railway over a woodless, waterless, frequently stoneless and always metal-less steppe to be under 95,000 roubles would be foolish, and would lead to the bad construction of stations, wells and ballasting. Finally as regards the 5th route from Semipalatinsk to Vyerni and thence to Tashkent it may be said that although in a technical and even economic particular it would be the easiest and most advantageous it has no sort of probability of being accomplished in a future at all near. When the population of Western Siberia is increased and the Irtysh becomes an important steam route then the union of Semipalatinsk with Vyerni will be shewn to be not without advantage and in no way difficult. This line would be Central Asian in the widest sense of the word, for not only would it embrace a considerable portion of our possessions in that quarter but it would draw, in an economic sense, Djungaria and Eastern Turkestan to Russia. Under such circumstances these countries would not always be found in a state of revolution. With these short observations on prospective Central Asian railways, we conclude our review of the economic phase of the progressive advance of Russia towards Turania.

(To be continued).

V.

SPANISH MOUNTAIN ARTILLERY, PART IV. AND V.

BY LIEUT. J. C. DALTON, R. H. A.

(Continued from No. 37.)

LOADS.

Having dealt with the various parts of the pack saddle, we will now consider the different *loads* that are carried by it; viz: (1) Load of wheels (2) carriage (3) Gun (4) Ammunition (5) Stores and baggage.

(1) *Wheels*. This load, as compared with the others and on account of its small weight does not affect the state of the stuffing of the saddle to such a great degree. The Equilibrium is fairly stable so long as the wheels are carried in the proper place, but there are a few disadvantages. The edges of the spokes rub against the front and rear edges of the frame of the saddle, thereby in time becoming grooved; the felloes also occasionally suffer in the same way; and although it is true that this does not render the wheels unserviceable still they get considerably deteriorated as was apparent to any one who saw the original *matériel* of the 1st Battery of Mountain Artillery which they handed in to store at Barcelona, and as it is not necessary to have wheels with such a great dish, this fault could to some extent be avoided. The bar of the '*porta-vueñas*' (the part that carries the wheels) is fixed to the sides on the exterior by 3 wooden screws, and they are apt to be forced out by the weight of the wheels on the arms; it would not cost much to fix it on the lower part of the sides which would make it much more secure and necessitate fewer screws.

The iron axletree of the carriage fits rather loosely into the mortices in the sides; and this looseness produces much noise and oscillation and the axletree arms coming between the spokes of the wheels knock against them and damage them. It is evident that if this mortice were trapezoidal instead of rectangular, the axletree would fit it better and once placed on the saddle it would fit like the tooth into a toothed wheel leaving the upper part with sufficient play to load and unload the *matériel*.

Care must be taken not to make fast the wheels by passing the straps over the tires, otherwise the slightest movements would cause friction and soon cut them. This load requires to have each part firmly and carefully attached. The driver of the mule carrying the wheels is

in charge of the spare headgear corresponding in number to the piece, and must carry it with him.

(2) *Carriage*. This is the most difficult load to manage by reason of its height above the saddle, therefore the centre of gravity must be lowered as much as possible, provided there be no danger on hilly ground of the trail touching the croup of the mule.

With this load the pack saddle ought to be a little higher at the back, because the oscillations of the trail cause a strain on, and by degrees compress, the stuffing of that part of the saddle, hence the Artificer (*bastero*) must look especially after this load on the line of march, in order to correct any defects he may observe and prevent galling.

If it is desired that the pack saddle fit well, a newly stuffed saddle should never be used for the first time with this load, because the gullet is rather deep and the saddle is not very firm on the mule and liable to oscillate, especially as this load is the highest of all; also the detachment have to be constantly adjusting it and pulling at it first on one side and then on the other, thereby spoiling the shape of the saddle and annoying the mule extremely. In addition, the load is not steady, the oscillations are constant and vary with the tightness of the girth, consequently the mule is girthed up tighter and tighter and girth galls ensue. For these loads the double girths are to be preferred because they support the pack saddle better and do not allow of so much movement over the region of the kidneys.

With this load are carried the side arms and other carriage stores and the two cartouches, when not carried by the detachment.

(3) *Gun*. The weight comes rather on the front part of the saddle, hence galled withers and shoulders have to be guarded against, and the stuffing is shifted slightly towards the forepart, and the vertical through the centre of gravity slightly inclined towards the rear, thereby relieving the animal's forehead of a great part of the weight and increasing the facility with which the mule can be loaded by the detachment.

The great point to attend to in loading up the animals is to see that the centre of gravity is as nearly as possible in the line of intersection of two vertical planes, one of which passes through the centre of the saddle and the other through the line of the arms for carrying the wheels. The most frequent cause of injury to the animals is from the C. of G. not being in this line.

With pack saddles for either gun or carriage which incline much to the front or rear, this defect can be to a certain extent remedied by changing the loads carried on them for a few days, provided that the weight acts at different points.

Special mules are required for carrying the gun and carriage on account of the peculiar nature of these loads and it is only the experience of a day's march which can guide us in the selection of the most suitable animals. With the gun is carried the cooking pot (on the right side) well secured, also the levers for carrying the gun.

(4) *Ammunition.* The equal weight and symmetrical nature of the Ammunition and the good lateral position the boxes occupy, render them the most convenient load for the mule to carry, although the heaviest. They should always be arranged so as to have a slight fall to the rear, for the sake of stability and should be strapped so tightly on that they cannot shake about when the mule is trotting.

The first mule carries the shackles and the water bucket and the others carry the tarpaulin covers, one on each load suitably folded and of the same size as the box, attached by the straps on the outer cases.

(5) *Stores and Baggage.* It is to be hoped that when the good qualities of the Plasencia gun are generally known, that the number of stores will be diminished, as the boxes for them weigh more than those for the ammunition, and are almost more than the mule can carry; it would be an advantage to diminish the weight and size of these boxes and those for the baggage for they oscillate greatly and take up so much lateral space when on the mule, that there is often difficulty in getting them through narrow places, also they hit against walls and catch in trees and in the slopes of narrow and deep paths.

Especial attention must be paid to the equilibrium of these loads, their arrangement is similar to that of the ammunition; judicious distribution of the boxes of stores greatly influences the comfort both of the animals and of their drivers. Taking all this into consideration and supposing that a battery is never split up into isolated sections for any length of time the following is the manner in which the loads would be distributed.

Sections.	No. of gun.	Loads.	Boxes.	Weight.
1st.	1	{ Gun Stores. 1st. Section	1	Heavy.
		{ Store of iron for Battery	1	
	2	{ Baggage of Lieut. 1st Section & Sub. Lieut.	1	Light.
		{ Saddler's tools	1	
2nd.	3	{ Gun Stores 2nd. Section.	1	Heavy.
		{ Farrier's and Wheeler's tools.	1	
	4	{ Medicine Chest; some Shoes	1	Light.
		{ Baggage of Lieut. 2nd Section & of V. S.	1	
Staff.	{	{ Battery Office (books &c.,)	1	Medium.
		{ Captain's Baggage and Cash Chest	1	
Total			10	

Mules with spare pack saddles.—The cases which are told off for the animal's rations have proved so bad and give so much extra work, that all the Sections of Mountain Artillery whether in the North, Centre, or in Cataluña, have unanimously discarded them and have adopted the system of carrying the barley in large sacks containing 9 or 10 double rations. Their weight is less than that of Ammunition boxes, they are easily re-loaded on one side more than the other, by which means a mule can be saved from becoming galled in one particular spot which may have become tender from other loads.

Mules without Pack Saddles, 1st and 2nd Reserve.—It is found convenient to have one of these per Section which carries a small saddle, in order that one of the artificers, or a sick man may be mounted on him.

It is not desirable to mount a man on a bare backed mule or even on one with a *Manta* (blanket) on it, as there is danger of giving them nasty galls on the back bone.

If we carefully examine different mules, we see at once that their shapes vary greatly and that even with one particular mule it does not always follow that both sides of the body are symmetrical, from which facts it is plain that if one makes the saddle fit the body of a mule as plaster fits a model, it would be very prejudicial to change them from one mule to another.

If a pack saddle hurt a mule, have the defects corrected, but never change the saddle; a Section which on account of having 2 or 3 mules galled, changes their pack saddles in order to avoid further injuries, will in time become ruined.—A mule however galled he may be can always as a last resource carry his pack saddle if it be properly chambered over the place and have no load on it.

When the stuffing is new, the saddle should carry loads of cases for 4 or 5 days; then when it has about half settled down, the gun or carriage can be loaded on it supposing it to be adapted for those particular loads; the *bastero* (Saddle maker) then notes the movements of the saddle and of the loads, and thus remedies defects the moment they appear. The Saddler is the mainstay of a battery and on his intelligence and activity depend the efficient transport of the *matériel* without detriment to the animals.

Effects produced on mules by bad saddles and careless loading.—Immediately the weight of the load ceases to bear equally on both sides of the mule, that side getting more of the pressure suffers and a swelling (*levante*) or gall (*matadura*) appears; both with greater or less intensity according to the pressure; and more or less serious according to what part of the body that pressure is exerted on. It is important that the Officer in charge of the section should know at once how far these are dangerous, in order that he may prevent any bad results arising from them,

and correct the defects in the loading or saddle as soon as possible, according to the exigencies of the situation.

Often, however well loaded the animal may be, or however good the pack saddle, extraneous causes, which cannot be noticed at the time of the examination, affect the animal so that at the end of the day's journey he appears jaded (*tocado*). But more frequently the fault may almost always be traced either to the manner of loading or to defects in the stuffing of the pack saddle, and the remedy then is easily settled on.

We have already treated of the distinct conditions of the loads and of their defects; it now remains to consider those of the saddle, pointing out the injuries that result to the mule from its bad construction. These are caused by,

(1) Uneven pressure in stuffing of panels.

(2) Badly executed repairs, either from using wool which has been too much or too little worked, or from leaving the joining too much exposed.

(3) Insufficient elasticity of lining.

(4) Interposition of extraneous substances between the hide of the animal and panel.

In the first case, small pads are placed between the animal's body and the part of the panel nearest the sore place, removing the projecting stuffing either of the contiguous or opposite side; always taking care that the Equilibrium of the load is maintained.

In the second case, the repairs should be done over again. When repairs have to be made to the stuffing of Pack saddles it is much better to make them large than small, as the latter never hold. The wool should have been used if possible, as thereby it becomes more homogeneous.

One pack saddle can bear four large repairs to the stuffing which will last one year if in daily use; at the end of this time the saddle must be stuffed and lined anew.

In the third case when the lining does not give sufficiently, the stitches break, as happens frequently with newly stuffed saddles; the drivers should know how to remedy this and should be most careful as to the panels being quite clean before saddling up the mule. The galls arising from neglect of these points are due to the carelessness of the driver and bad results may accrue therefrom.

On seeing the part that is galled an opinion can be at once formed as to whether the effects will be serious or not. If the injury be on the

back bone, it is not only serious but takes a long time to heal; the gullet of the saddle must be made as wide and deep as possible and the wool removed from each side of it, so that it may not touch the part affected in the slightest degree.

On the withers these sores are apt to become more serious and occasionally are accompanied by a fungous growth very difficult to heal, and the animal affected becomes incapacitated for some time. Galls on this part as well as on the shoulders are apt to cause lameness, because inflammation hinder the proper action of the bones.

Swelling and galls on the sides are less important; the mule can almost always be worked with them, as a good chamber sufficiently large and deep, in the stuffing of the panels will entirely prevent any friction of the part affected. The best plan is immediately to repair the saddle which has once galled the mule, even though it may shorten the period the saddle will last.

Though not dangerous, still, galls caused by the points of the frame of the saddle take some time healing on account of the small amount of vital power in those parts of the body, these galls may be called "*falderas*" (affecting those parts of the sides near the girths, they are not however girth galls). As shewn above, pads and hollows conveniently placed will meet these cases.

The following classification of galls and swellings caused by the bad arrangement of the load or by the condition of the pack saddle may be given on a *résumé* of what has been already said.

- (1) Those caused by the gullet of the saddle being
in contact with back bone ... Serious and slow to heal.
- (2) By saddle being too far forward on
withers. Complicated and dangerous.
- (3) Caused by girths Not serious, but slow to heal.
- (4) Caused by any other part of saddle between
front and rear arches ... Not serious and soon healed.

If the animals are not carefully and daily watched when on the march, it may happen that a careless driver though knowing that his mule is galled, will load him the next day as usual, without any attempt at a remedy and this may cause such a serious sore and re-absorption of pus that the animal may die from effects of it.

The treatment and cure of the animals is of course in the hands of the Veterinary Surgeon, but the Officer in charge of the section should inform himself as far as possible in everything concerning the class of wound from which putrefaction or mortification may ensue. He must clip all the hair from the part injured, and place a thin layer of tow in the chamber made in the stuffing, and keep constantly changing it

so long as there is any matter coming from the wound, and the Veterinary Surgeon must be informed of the case as soon as possible.

As a general rule, to cure these cases, antiseptics and caustics are employed; first of all the sores are washed with salt and vinegar, wine or brandy and then astringents applied, such as alum, ashes, salt, and even as a last resource, the dust off the road. Medicaments do no more than prevent and delay the progress of disorganization of the tissues; nature herself forms a crust or scab over the live tissue (to keep the air from it) under which the cellular system continues increasing and forming thin organic layers of skin, and the scab eventually falls off. On the rapid cure of these hurts, the treatment of the animal has an important effect; good food, clean stables, and moderate rest, are absolutely necessary; above all, the work of cicatrization of the organic molecules or globules must never be interrupted.

A battery with the complement of mules as already shewn, in which these precautions are taken, can operate in conjunction with the best battalions of riflemen without any need of having to apply to them for animals to replace mules unfit for work, and without leaving loads or pack saddles behind in the villages they pass through; for such necessities always affect the reputation of the Mountain Artillery for good organization.

PART V.

ORGANIZATION OF A BATTERY.

For mountain warfare an army should be divided up into a number of groups or columns, each sufficiently strong to harass an enemy and beat him on coming in contact with him. Each of these columns is formed of the three arms, including Artillery, in such a proportion that there should not be so much as to embarrass the force by being in the way, nor so little as to produce an insignificant effect. Taking the Cataluña provinces as examples of the ground, and the war in them as a type of mountain warfare, the organization of the Artillery appears to satisfy the necessary conditions viz., lightness and mobility, ability to keep up with all the columns in their marches, a sufficient reduction of bulk to ensure its not impeding the movements of any of the other troops, and furnished with sufficient stores and munitions to be able itself to make up any deficiencies of *personnel*, *matériel*, and animals for some time.

No fixed rules have been made for the allowance of guns to each brigade and several of these and the columns operating in Cataluña have each one section of 2 guns; and in the Army of the North, the same sized brigades have each a battery of six guns.

Both proportions appear defective, at least such is the humble opinion of the writer of these lines and for the following reasons:—taking the Section as the tactical unit, and as forming the proportion to one brigade or part of a brigade, two guns seem a small number with which to commence an action, and certainly to maintain it and cover a retreat.

The Sections are justly the smallest battery unit for purposes of operating together or in combination, but never isolated. As the fire of Artillery directed on masses or on troops of the enemy, ought neither to be too rapid nor yet too slow, but regularly maintained, it would be difficult to accomplish this with 2 guns only; one reason being that it is necessary frequently to sponge out the guns during the firing, another that the breech screw, &c., might get out of order and in consequence much valuable time be wasted and perhaps at important periods, and hence great results might be lost.

Moreover, following the maxims of that great Artillerist, Napoleon I., one should never employ too small a number of pieces because the useful effect is barely appreciable; and for Artillery to operate with marked utility its moral effect should be decisive, and dreaded by the enemy.

It is necessary to take advantage of opportune moments, and by keeping up a constant fire, directing at the same time a large quantity

of projectiles against the object, the enemy is forced soon to charge his position.

According to the number of shots, so ought the chances of hitting the object to be greater or less in number and although 2 Plasencia guns can make a great percentage of hits when practising at the school of Gunnery, this diminishes considerably in actual warfare from not knowing exactly, and from a variety of other reasons.

From experience as well from a tactical point of view we may safely assert that the fire of two isolated guns is neither useful nor advantageous in small operations such as we refer to.

Again, on the establishment of a battery, there are 2 shoeing smiths and a wheeler and by separating the 3 Sections, that Section which is deprived of the services of either or both of these artificers must be at a disadvantage, for if the *matériel* becomes seriously damaged, or if during the firing any bad defect occurs which a skilled smith alone can repair, and if he be not with the Section, the firing may have to be discontinued and the gun remain for some time mute. If the Sections are together, all the necessary elements are at hand so that the maximum amount of service is obtained with the minimum number of men and stores, and this is a very important item in the organization of armies that cannot afford to increase their impedimenta nor carry other men than combatants.

A section only possesses one officer and however active and zealous he may be, he cannot exercise the necessary vigilance and attention as in a battery, when, besides the Captain, the other officers attend to the management, care, and housing of the men, animals and *matériel*; by which means duty is better performed and with less trouble. In a section what with ordinary duty, office work &c., one officer is over worked.

Again if the battery be divided up into sections acting independently, the amount of official and documentary work is tremendously increased, for each section becomes an organic unit, and all orders, circulars and other documents bearing on administration and interior economy have to be prepared in duplicate, triplicate &c. The bad state of the communications in the territory operated in, and the perpetual movements of the columns, are serious obstacles to the work of good administration, producing the deferring, or imperfect execution of the regulations and orders issued from the higher authorities, which is always prejudicial to the service.

The *Majoria* (H. Q. Staff) has to keep up a correspondence with all these small units and every subject suffers from the above mentioned faults and they are only really felt in the regiment itself.

It would be better therefore that these fractions should be re-united and concentrated, and reduced to the smallest possible number, and there can be no doubt that the new formation of 4 batteries into one

brigade, with its own head quarters, has been a useful and advantageous measure to relieve the *Mayorías* of the work which was always accumulating from day to day in their offices.

The batteries of 6 guns have 200 men, an excessive number, which gives much extra trouble during a campaign, because, not only does the increase of men cause an increased amount of correspondence and documents to carry about, but also a greater number of returns, promotions and alterations which far from simplifying matters, unfortunately keep on increasing; and the Captains or Majors of batteries are obliged to devote their spare time, not to practical military duty, but to Office work, which is perpetually in arrear.

The number of animals and amount of *Matériel* increase, and there is much difficulty in billeting them in the small mountain villages, also there is no space to form the battery up and it blocks up and obstructs the streets. The march in column through roads so narrow that the detachments can't march beside their mules, occupies a considerable length of road compared with that for the rest of the column and forms the weak and assailable point of the whole force.

Experience appears to favour batteries of 4 guns as the most convenient number, either from a tactical or from an administrative point of view. Therefore for the above reasons and taking it for granted that the battery is to be both the tactical and organic unit, and that sections are never to be isolated, we proceed to the establishment of the battery considering first that of one subdivision (one gun).

Establishment of a Subdivision.

Where posted.	Number of men.	Rank.	Number.	Horses	Mules
Trumpeter or Acting Trumpeter	1	Trumpeter ...	1	1	...
Number 1 of Gun ...	1	Sergeant (2nd class)	1	...	...
In charge of loads ...	1	Corporal (1st class)	1	...	...
In charge of detachments on right and left ...	2	Corporals (2nd class)	2	...	...
First Gunners, in charge of wheels and gun ...	2	Gunners (1st class)	2	...	2
Second Gunners—Drivers ...	9	Gunners (2nd class)	17	...	9
„ Gun Detachment	6				
„ Spare and Staff...	2				
TOTAL. ...	24	... ..	24	1	11

Distribution of a Battery (as proposed).

	Captain	Lieutenants	Sub-Lieutenants	Vet. Surgeon	1st Sergeant	2nd Sergeants	Trumpeters	1st Corporals	2nd Corporals	1st Gunner	2nd Gunners	Shoeing Smiths	Blacksmith	Saddler	Farrier	Wheeler	Officers & men Total	Horses	Mules	
Two Guns	...	...	...	...	...	2	2	2	4	4	34	...	...	...	...	...	...	48	2	22
Staff of Section	...	1	...	...	...	...	...	...	...	...	...	1	...	...	...	...	1	1	2	...
Total of Section	...	1	...	...	...	2	2	2	4	4	34	1	...	...	...	...	1	49	4	22
Two Sections	...	2	...	...	...	4	4	4	8	8	68	2	...	...	...	...	2	98	8	44
Staff of Battery	1	...	1	1	1	...	...	1	...	...	1	...	1	1	1	1	3	7	4	1
Ten per cent spare to replace casualties.	...	...	...	...	...	...	...	...	...	...	11	...	...	...	...	...	...	11	...	...
Total of Battery.	1	2	1	1	1	4	4	6	8	8	80	2	1	1	1	1	6	116	12	46
Proportion according to present arrangement.	1	2	1	1	1	2	2	7	6	4	105	2	1	2	2	1	5	135	10	48

It is highly desirable that the trumpeters should be mounted, because on a campaign they could be billeted in the house with the officer in command of the Section, act as orderly to him, take care of 2 horses and look after them during the firing; also by this the services of one more gunner would be gained to the battery.

To ensure better order and regularity in the service, a 2nd sergeant is told off to each piece and he has charge of all the men, animals and stores belonging to it. The subdivision of one gun should correspond in its organization and administration to the squad of infantry.

One first Corporal is in charge of four loads of ammunition, looks after them during a march and he alone during the firing may remove and arrange the cartridges and shells in the boxes to preserve Equilibrium; in billets he assists the sergeant in the general care of the subdivision.

Two second corporals are told off to each gun, acting on the right and left sides respectively, and direct the loading and unloading of the gun and carriage.

For the drivers of the loads of wheels and gun, two gunners per piece are selected, partly by seniority partly for good conduct and for other reasons; and they act at times as corporals of squads.

The six men of the detachment (2nd gunners) with the two Corporals are the eight men who work the gun.

The boxes of iron, shoes, stores and baggage can be carried and loaded by the artificers and other available men.

The senior Corporal does not suffer any inconvenience by being dismounted and his horse and that of the battery orderly was reduced in favour of the trumpeters whose duties it was considered rendered it more necessary for them to be mounted, and also because it was found that they suffered greatly from Phthisis; also they can effectually discharge the duties of mounted orderly.

Comparing the actual establishment of a battery with what we have proposed, there is a difference of 19 men and 1 mule. It is true that they carry only 4 loads of ammunition per gun; this is sufficient generally for mountain warfare and compared with the number of cartridges which an infantry soldier carries, the latter consumes his allowance much sooner than the Gun.

In this manner we believe a modified establishment can be formed, complete in all its parts and at the same time both a Tactical and administrative unit; it satisfies the exigencies of mountain warfare and the interior economy is not too combersome to manage.

Personnel.

The height of a gunner in a mountain battery is just over 5 feet, 7 inches; he must be strong and able bodied so as to be able to load and unload rapidly and easily; above all of sound chest and good constitution and able to bear fatigue, for it is an indisputable fact that his duties are more trying than in any other branch of the service.

The special care of the mule demands, more particularly, men brought up to agricultural labour and therefore the Arragonese, Catalans, and Navarrese appear most suited, partly because of the nature of the climate in which they have been brought up and also because these countrymen are in reality more enduring and robust than the rest of the Spanish nation. In a campaign, the comforts of the Mountain Artilleryman should be attended to before those of men of other branches, on account of his harder work and because with all the fatigue of a foot-soldier he has none of the advantages of a mounted man; also his larger frame needs more sustenance than that of a smaller man and his clothes get sooner destroyed owing to his being perpetually on fatigue duty.

On arriving at a place he is delayed some time at stable duties and in parking the *matériel*, so that he is the last man to be housed and the last to receive his rations to cook; in many villages where there is not a great stock of food, the other troops getting the first chance supply themselves at once and exhaust it in a moment, leaving the gunners with little less than the ration bread to eat. These circumstances have led one to consider how far convenient it would be to provide each Section or subdivision of Artillery with utensils and pots sufficient to cook their rations during halts. These culinary utensils could be carried in wicker baskets on the boxes of stores and baggage, with the rations of pork rice &c.

Clothing.

The clothing does not satisfy all the conditions of comfort and durability that could be desired. The head-dress neither keeps out sun nor rain. The coat with its wide skirts is not the most convenient dress for marching over broken and craggy ground often covered with brushwood and prickly plants; in the exertion of loading it tears about the arms and the buttons come off, moreover in summer if worn by certain individuals they would be liable to produce Asphyxia.

The leggings need much reform, as they impede walking and the fastening often breaks after the first day's march; also the knapsack and havresack might be improved on. The troops should carry as little kit as possible and it should be suited to the nature of the climate in which they are operating; a spare pair of sandals should invariably be carried, a most necessary article in this sort of warfare which has even been called by some critics "*guerra de alpargata*," (war of sandals) on account of the great distances walked.

The "*Machete*" (short chopping sword) is rarely used and might be replaced or done away with; the weight of it causes so much friction against the left skirt of the coat and pantaloons that it wears them out. The imperfections of these portions of the soldiers kit and accoutrements spoil his appearance which reflects on the judgement of the officers of the batteries and on the regiment in general.

Service of a battery in the field.

We will now consider the battery as organized and forming part of a brigade operating in pursuit of an enemy for several days without interruption marching for, from 10 to 12 hours a day with regular halts to rest the troops. The march and duties of the Artillery would be regulated as follows:—

At day-break (ex. 4.15 A. M.) or at an hour previously arranged, the drivers first of all without a moment's delay feed their animals; the Officer on duty will see that they all get the ration carried in the nose-bag (one Cuartillo). A mule takes on an average 20 minutes to eat the ordinary ration of 2 Cuartillos. If there is no time to spare, the animals are loaded up in succession and any barley left in the manger is replaced in the nosebag. If there is plenty of time they are allowed to eat it in peace. Having given out the feeds, the Corporal in charge sees that the sacks of barley are conveniently arranged to be loaded on the animals. At the same time (at daybreak) the officer next for duty proceeds to the place where the *matériel* is parked, where are assembled at the same time the sergeants and detachments and he sees that they arrange everything ready to be loaded and to form the battery up. The Captain arrives in good time at the place of formation and when the proper hour arrives he sounds to load up, or passes the word to the drivers in case trumpet sounds are not permitted.

As soon as the battery is ready, if there is time, after the roll has been called, an inspection is made; and the battery remains ready to move off at the command of the Officer Commanding the column who also orders the position &c., that the battery will take in the column as regards the other troops.

The general order of march (suppose now it is 5 A.M.) is in Column of subdivisions and it is advisable to send on the manœuvring part of the battery with the 2 Lieutenants; the Sub-Lieutenant and Sergeant Major follow in charge of the loads of boxes &c., the Sergeant Major riding in rear of the Column so as to see that no one falls out and also to see to the equilibrium of the loads of stores and baggage.

Whilst on the march every man must be at the place assigned to him, the drivers do not quit hold of the reins or head-rope of the mule, except in the cases which we shall mention later on, the detachments march along side their respective loads, and the whole battery is ready

at a moment's notice to engage the enemy or respond to an unexpected attack, never forgetting the fact that it is marching in an enemy's country. If at the end of 2 hours (say 7 A.M.) there should be a short halt, the Officer Commanding the battery finds out from the C.O. how much time he has to unload the *matériel* and however short it be, he will unload the gun and carriage, put the nose bags on, and during this halt look round and correct any defects, and tighten up girths.

About midday the battery should have a halt sufficiently long to let the men have their dinners and feed the animals; if it is in a village, accommodation can be found temporarily for man and beast, and if in the open the mules remain in the charge of the gunners, it not being prudent to tie them to the carriage or ammunition boxes as it is liable to cause accidents. Water and food should be given to the mules on every available opportunity, for knowing that a crafty and changeable enemy is being pursued it can never be told when he may be overtaken: also if an opportunity be lost of giving water, in the morning for example, there may not be another for hours.

Moreover the man can drink and eat as he is marching but the animal requires suitable places for drinking and rest for eating. If the halt is of any length the pack saddle should be taken off and any galls bathed with brine to allay the inflammation.

At the evening halt (4 or 5 P.M.) the same is done as at the morning halt and the animals are given another cuartillo of barley.

On arriving at the place where it is proposed to pass the night, billets are told off, *matériel* is unloaded and the duties are as follows; the officer of the day accompanied by the Sergeants, files off the animals to see them stabled, seeing that they are told off to billets by subdivisions and in the regular order of loads, and if it is possible the stables should be near the centre of the village.

After the *matériel* has been unloaded, the drivers raise the cruppers, and loosening the breast harness pass all the straps over into the pack-saddle in order to ease the animals as much as possible and on arriving in the stables they give them some chopped straw and wash down their legs.

Another officer sees to the parking of the *matériel* by the detachments and then all drivers not billeted with their mules assemble at the gun-park and they and the detachments are then told off to their billets as soon as the guard has been mounted.

The Captain or Major remains in the park, receives the reports from his officers and attends to any complaints that may be brought before him. It is advisable that the detachments should be billeted as near the *matériel*, and the drivers as near their animals, as possible.

The saddles are not taken off till the Captain or Major gives the order which he waits for from the officer commanding the force. The animals are very liable to get touched by the saddles during the first few marches, and experience shews that these swellings are more likely to subside if the saddle be left on the mule for a short time after his arrival in stables; also it is the custom to treat these swellings by covering them with a wisp of straw soaked in some astringent liquid and keeping it in its place by a surcingle or girth tightly strapped; but the first precaution lessens the good effect of this remedy.

The mule whose back is already hardened may be unloaded the moment he gets into his stable, always provided there is no draught of air through the stable.

One hour after arrival or at supper time, if late in the evening, the mules are watered and fed, the roll is called, detail given out and forage distributed for the following morning; this being done, the men retire to their billets in accordance with the orders of the Officer Commanding the force which they must strictly observe.

The saddles are placed in the best ventilated part of the Stable, standing on the front arch so that the gullet is vertical, for if placed on the four points of the arches the panels get little air and also are apt to get dirty and pick up straws, small nails &c., the presence of which if the mule were hastily saddled up, would cause galls; besides another reason is, that the men would be tempted to make seats of the saddles and spoil their shape.

Some drivers damage the lining of their saddles very much in lifting them to put them on the mule, by catching hold of the wool with the nails of their left hand. This practice either proves that the man is not strong enough to saddle the mule properly by himself, or else that he does not know how to. A good saddle is one, the stuffing of which after 5 or 6 months in daily wear, is not reduced by more than $\frac{1}{2}$ its original bulk and therefore does not hurt the mule. In time the lining of the saddle becomes of a uniform dirty colour, from the sweat of the mule and owing to the pressure caused by the weight of the load it becomes a sort of mould shewing the exact shape of the animal's sides.

As long as the saddle does not hurt the mule it is quite unnecessary to touch the lining. Some mule drivers in order to remove this coating of dirt keep on drying and scraping the lining, but unless this is done with great care, the saddle suffers.

If the animal is galled, there are dark circles to be seen on the lining and therefore it should be examined carefully daily, and if this is noticed, the saddler must be at once called in, and the defects remedied; by these means serious galls should be averted.

If the animals have been long in one place without much work, they get fat, and when the packsaddle is placed on their backs it does not fit properly and is liable to hurt them; for this reason it is desirable that the mules should not be allowed to get too fat, but should be spare and in hard condition.

Often when a mule is galled, the fault is laid on the pack-saddle when in reality it is caused by the variation in the size of the animal's body, the more work the mule gets, the smaller its carcase becomes, and the bigger the saddle for it, especially if it has been newly stuffed; and unless care is taken and this change noticed, all the animals in the battery may become galled. The saddle (and especially the panels) is a sure indicator of the amount of work it has done; you can tell whether it has hurt the animal and in what particular part, also whether the saddles have been frequently examined and you can tell by the hair adhering to the lining what species of animal a battery has been using and whether well bred or coarse, and finally if the left side of the lining of the panels be scratched and thin you may conclude that the driver does not know how to saddle up his mule. These observations together with the dirtiness of the lining, the want of straps, and badly executed repairs, prove pretty conclusively that the battery the saddle belongs to, is in a deplorable state of slackness and ignorance.

Marches.

The mule, and therefore mountain batteries generally, moves at a very regular and constant pace. At an ordinary walk it will cover 1 kilometre (5 furlongs) in from 10 to 12 minutes, or 5 kilometres (a little over 3 miles) an hour, and can keep it up for as many consecutive hours as the best troops can, provided good management and order be maintained on the march.

His Excellency, General D. Odoá Macías, who thoroughly understood the requirements of the Artillery, issued amongst other orders the following, which is as brief as it is expressive, viz: "The Artillery shall regulate the pace." In short on him who marches a column, whether well or badly, depends to a great degree, the efficiency of the Artillery; for whether the march be long and at a rapid pace, obliging the mules to trot, or very slow with repeated halts, the mule becomes exhausted and injured and the *matériel* gets damaged.

Mountain Artillery on a level carriage road moves at the same pace as infantry, down hill or on rocky roads, slower, and up hill, or in wooded country, faster. If the marches are irregular, moving at times very quickly, at others slowly with frequent halts and delays of which no notice has been given so that the loads may be taken off; not halting at convenient places to water the animals, nor giving sufficient time to feed them and to feed the men; the efficiency of the Artillery is seriously impaired, and hence the reason that very often one finds that the droves

of pack mules belonging to the peasantry appear stronger and fitter than the animals of a mountain battery, which may unfortunately often be forced to operate in such an irregular manner.

Night Marches.—These are very bad, although the mule goes so well in the dark. Some go to sleep and if an accident occurs, it takes a long time to repair. It is advisable for the mounted men to lead their horses along bad bits of road and the animals should be kept together, and strict silence and order maintained. In case the troops in front should be lost sight of, it is good to keep up communications with them by means of a cordon of some of the detachments, and thus the track is not lost; this is of special importance in snowy weather and in thick woods or plantations.

Hills.—If they are moderately long, the cruppers and breast harness should be arranged to suit the incline before commencing it. If they are very steep and dangerous, the loads should be secured by drag ropes manned by the detachments on whichever side is necessary to prevent the loads from oscillating.

The packsaddle on account of its shape is more apt to shift forward when going down hill, than backwards when going up hill, therefore the breast harness should have more play than the crupper. If a halt is made on a descent, and it is not possible to unload the matériel, the animals should be made to stand across the road so as to relieve their forehands of the weight which is prejudicial to them.

Passing rivers by fords. If there is not much water in the river it is customary to have stepping stones or small wooden bridges, called in Cataluña, "*palancas*," for men to cross by; the animals can be connected by ropes and the mounted men take them to the opposite bank, by leading the front mule by the head. Once the animals have become accustomed to passing fords, it is quite sufficient to lead the first mule and the others will follow. There must be some men of the detachments stationed on both banks to see to the loads, should they get out of position, which will occur often with many mules because they lift their feet higher and bend their backs, causing consequently so much movement to the loads that unless the detachments watch them very closely, the loads may fall off into the water. It is not safe to allow loaded mules to pass fords where the water is deeper than up to their chests, unless the bottom of the ford is very well known.

Rains. For cleanliness the tails of the animals are often tied up, and on account of the bad quality of the havresack, the gunners might well be permitted to carry theirs under the oil decks of the loads to protect them from wet. The animals always get very hot over the region of the kidneys especially in summer, and the cloth thrown over their backs to protect them, really does very little good on account of its bad quality. It would always be a good plan to rub that part of the animal

with spirit on arriving in billets. Rain refreshes the mule and renews his strength, if it comes towards the end of a day; and acts as a tonic, the same as a cold bath.

Thunder frightens the mule, and violent hailstorms cow them to such an extent that they will often refuse to advance; the best thing to do in a case of this sort is to form the battery into line if possible, at close interval by which means one mule serves to protect another to a certain extent from the hail stones and a little confidence is inspired; the battery then waits till the storm has passed over.

Appendix.

The utility of Mountain Artillery varies greatly according to the country it operates in, and we may consider 3 different kinds of country viz.,

- (1) Hilly.
- (2) Mountainous.
- (3) Very Mountainous.

(1) The first, is that formed by sinuosities of ground more or less elevated, the hills being generally accessible from several sides, the ground cultivated, traversed by a net work of carriage roads which pass over inclines of every gradient, and fairly long ranges can be obtained. On this class of ground, Artillery can be employed with wheel draught using shafts; and bearing in mind that one good mule can bear the weight of the gun for a whole day on his back, the weight may be increased by 30 or 40 Kilogrammes, profiting by having the better disposition of wheel draught instead of putting weight on the animals back, and thus by using the shafts when available we obtain an Artillery with a small track to use on carriage roads and can change it on to the animals backs when the country becomes difficult which does not often occur with the country we are at present considering, viz. the provinces of Tarragona and Alava.

(2) In the second case, the roads are generally narrow, of variable slope and stony, the shafts are not able to stand the wear and tear and generally some parts break, either the hooks for the traces or at the splinter bar, and it may be confidently asserted that in mountainous country possessing no regular roads, Artillery cannot be transported with shafts; from which it is inferred that Mountain Artillery cannot or ought not to carry them, they being only in the way.

The true merit of a battery lies in its being always able to carry its *matériel* on the backs of animals without hurting the latter.

Respecting the effect of the fire it may be said that Artillery loses its importance as it leaves level country for mountains. The former

offers little cover to the enemy from the Artillery fire, and the more level the ground under fire, the larger the dangerous zone for the enemy; in this case if the enemy is formed in large masses the destructive effect of the gun is much easier observed than among mountains and fighting against small bodies of guerrillas, when it is quite a rare occurrence to find an opportunity of opening fire on them.

In mountainous country, ricochet and direct fire are not much employed, the surface of the mountain is generally at an inclination of 45° to the horizon, and it is not easy to find a position where the guns can be concentrated without having to employ depression fire; on the contrary it is very difficult and the fire is of little good.

The employment of Artillery fire under such circumstances is a mistake, for it causes it to lose prestige and to become insignificant in the eyes of the enemy; it also deceives its own troops who judge the destructive effect by the noise the report makes, reverberating through the ravines and rocks. To take many pieces into such ground is to expose the Artillery to the danger of falling into the hands of the enemy unless they are well protected and have some kind of roads to move on. If the tactical reasons are sufficient to give credence to this assertion, the experience taught by the loss of the guns of the 1st Regiment of Mountain Artillery, taken by the Carlists in 1873-4 will support it.

No one doubts that Tristany and Saballs are two experienced Guerilla chiefs, they would only employ Artillery to attack villages, and said that it hampered (*Estorbaba*) them on other occasions, as it required so much care to protect it. Moreover the case will be rare in Mountain warfare where success will be due to the Artillery; hence it should be used with judgement on occasions, and should be employed in groups or batteries of 4 pieces as we have already pointed out, forming parts of brigades of other Arms inured to war, who would protect them and not forsake them in reverses.

(3) Lastly, in very mountainous countries such as the Northern part of the province of Lerida and all the slopes of the Pyrenees, in which the roads are rocky, on the brink of precipices and commanded by steep inaccessible mountains even a very small amount of Artillery would be so much exposed if it penetrated into such a country, that without doubt it would be of more trouble than profit; the villages of those neighbourhoods are utterly destitute of the wherewithal to repair *matériel*, and therefore during the whole time the Artillery would pass in such a country, it would not be able to repair defects and the battery would gradually become ruined.

For these reasons it is so difficult and costly to keep up a force of Artillery in districts like these that the small services it can render do not compensate for the trouble and expense.

More might be said about Mountain Artillery but the object of this Memoir is merely to refer to the conditions of mobility that must be fulfilled by a battery so that it may work in a campaign with the best possible effect, both as regards its constitution and preservation, and the most suitable ground for it when co-operating with the other arms of the service, to ensure a successful and victorious issue.

VI.

MULE BREEDING.

BY VETERINARY SURGEON J. J. MEYRICK, R. A.

In consequence of the Secretary of the United Service Institution of India having expressed a wish for a paper upon mule breeding for Military purposes—in the course of correspondence with the General Superintendent of horse breeding operations, the latter requested me to endeavour to write something about it—I therefore offer the following few observations upon the subject.

Its importance cannot be overrated, owing to the enormous destruction of Camels and Bullocks in the late war, which will cause a scarcity of them for several years to come.

The question then is, what resources are possessed by India for breeding mules, and what are the best means which Government could adopt to encourage their breeding to the utmost.

Before considering this it may be worth while to give you some idea of what has already been done in the way of mule breeding.

For many years mules have been raised in the Northern Punjab, by the natives, without any assistance from Government.

They were bought in large numbers for the Abyssinian war, and it is said that none used in that expedition shewed greater hardiness than those of the Punjab.

There are many remarkably fine animals still to be found in various parts of the country but the majority are decidedly inferior to what they might be both in shape and muscular power. This inferiority is attributable I believe, partly to the haphazard way in which their dams are covered by common country donkies, partly to their being starved and over worked while in foal, and partly to the mules themselves being underfed and worked hard while young.

Government has already done a great deal towards the improvement of mules by supplying good donkey stallions of various breeds, chiefly in those parts of the Punjab in which horse breeding operations are carried out, and by giving valuable prizes for the best mules at the fairs in Rawal-Pindi. These prizes no doubt induce numbers of breeders to feed the young animals well and work them moderately.

Altogether about 1,400 mares have received the brand which entitles them to be covered by the donkey stallions belonging to Government.

It is impossible for me to state how many have died or been disposed of in various ways, and how many have been covered by country donkies through the indifference of their owners, but during the present breeding season 1,044 have been put to the Government stallions.

As to the resources of the country for mule breeding there are numbers of small unbranded mares which are sometimes covered by country donkies and sometimes by tattoos, and multitudes, both in the Punjab, North-West Provinces and other parts of India, which might be made available if their owners could be induced to breed mules, but many object to do so either upon religious grounds, or because they appear to think it degrading.

In the Punjab, besides ponies, full sized mares sometimes receive the donkey brand because they are either so unsound or so badly shaped as to be worthless for horse breeding.—Mares of this kind will be valuable for producing mules of sufficient size and weight for draught purposes, as it is a fortunate fact that the mule inherits the shape and peculiarities of his sire to a much greater extent than those of his dam. The latter chiefly transmits the size of her own frame but rarely her bad shape or unsoundness if covered by a vigorous donkey. In horse breeding as you all know, this is not the case.

Defective shape or unsoundness is so frequently inherited from the dam, that great care is necessary in rejecting mares of very bad build, or that have any unsoundness likely to be hereditary, and also in selecting stallions who by their bodily structure will have a chance of counteracting the defective shape, action or breeding of the mare.

Even with every care the proverbial saying that horse breeding is a lottery, is to a considerable extent true. While some sires so stamp themselves upon their progeny that the latter can be constantly recognised even when only a few months old ; with average stallions the most experienced breeders cannot predict with any certainty whether the foals will most resemble them or the mare, whether they will partake about equally of the peculiarities of both sire and dam, or whether they will throw back to an ancestor of one or the other.

In mule breeding this uncertainty does not prevail to nearly the same degree. Of course the mother necessarily transmits some of her peculiarities, so that with the same stallion donkey, the good mares would usually throw better mules than the bad, but whether it is owing to the donkey having generally a stronger constitution than the horse or to some other ill understood reason, the fact remains that he does, in 19 cases out of 20, stamp his shape and soundness upon the mule.

At my inspections I continually find mules of excellent make running by the side of mares with every conceivable defect, and it is so exceedingly rare to meet with a badly shaped mule by a Government stallion,

that I venture to assert that, leaving out those which have been injured by starvation and over work, the majority of bad mules seen in the Punjab are the produce of ill shaped country donkies. Since however even the latter are seldom unsound, unsound mules are very scarce. They may and often do have limbs bent out of shape by their having been over-worked when half grown, or hoofs distorted by neglect, but a spavin, ring bone, side bone, or foot showing signs of laminitis or navicular disease, is rarely if ever met with.

Of course their exemption from these diseases is partly owing to their working usually at a slow pace and to their action being low and light compared with that of the horse.

Still in the latter, hereditary unsoundness is often met with at a very early age even before he is broken in. I have actually in a few cases seen foals only 6 months old with large spavins on the same hocks as those of their dams.—There may be similar instances amongst mules but I have never met with or heard of one.

These facts go to show that out of the numerous ill shaped and unsound full sized mares and the ponies of every kind both good and bad—multitudes of excellent mules may be bred if only proper measures be taken to ensure a plentiful supply of first rate donkey stallions. Mules, if well fed, have a tendency to grow taller than either sire or dam. I have often seen them in America nearly or quite 17 hands high. These were the produce of large donkies like the Spanish, with good sized mares.

Such tall mules can certainly draw very heavy loads but they are usually, so far as I have seen, too long in the legs, a defect in animals required for campaigning purposes.

It would probably not be advisable to breed many very large mules in India even for draught purposes, as those of moderate height are hardier, require less food to keep them in condition, and can carry or draw greater loads in proportion to their size.

Mares likely to breed the most useful mules for draught purposes are those from 14 to 14½ hands high and they should be covered by the largest donkies. For breeding pack mules the best mares are between 13 and 14 hands, certainly not exceeding the latter height.

The mules preferred by Mountain Battery Officers are, I am told from 13½ to 14 hands; and these sizes would undoubtedly be the best also for pack purposes in the Commissariat department.

A mule under 13 hands high is likely to be weak for such work, and one over 14 hands is too tall for natives of average strength to load easily.

While mares of the above mentioned sizes are the most useful I do not think it advisable to refuse to breed from any size whatever because the mules which are too large or too small for Army purposes are very useful for various kinds of other work and help to lower the prices of those required by Government.

At the same time we must remember the great difficulty experienced in supplying horses to the Indian Army and as mares of 14½ hands high, if well shaped and sound, may breed good remounts those of that height and upwards should, I think, be covered by stallion donkeys only when too badly shaped or unsound for horse breeding.

In taking measures to increase the supply of mules, the first thing to be considered is the kind of donkey best adapted to breed those suitable for the purposes required.

It is well known how disagreeable an ordinary mule is to ride, on account of his having, like the donkey, low upright shoulders, a straight back, and shuffling action.

If mules were required for riding purposes, the donkey stallion ought to have, to as great an extent as possible, those points which are most desirable in a riding horse, but as they are only wanted in the Army for pack and draught work, the points referred to may be disregarded, and donkeys of a different make are preferable.

In drawing a heavy load ; a large head, thick neck and upright shoulders, act at a greater mechanical advantage than a light head and neck and an oblique shoulder.

In carrying a heavy weight a thick upright shoulder and straight or roached back give increased strength, and the latter has the additional advantage of being less easily galled than a hollow one by the ends of a pack saddle. The following points should be particularly attended to in choosing the donkey stallion, in order that his progeny may be of that shape which experience shows to be the best for enduring incessant hard work upon insufficient or bad food.

These are, a broad round chest, with deep back ribs, powerful quarters, short back, muscular loins and short legs. The donkey should also be as well bred as possible in order that he may possess plenty of nerve force.

The donkeys belonging to Government now in the Punjab, are 50 in number of the Spanish, Arab, Bokhara, and Punjab breeds.

I have hitherto objected to the Spanish as being too coarsely bred, and certain to get mules of an inconvenient size for pack purposes, but now that, as stated by the Secretary of this Institution, mules are likely to be required for draught, these donkeys will be very useful.

It would probably repay Government to purchase more of them but should this be done, I strongly recommend their being as highly bred as possible and not over $13\frac{1}{2}$ hands high.

I wish here to make a short digression from the subject of mule breeding in order to refer to an idea which was first suggested by the Overseer of the stallion Depôt in Rawal-Pindi and has often occurred to me since. The Spanish donkies are fully as powerful as mules of the same height and it is very probable that the breed might be established in Northern India, by importing a few mares from Spain. If the stock retained their present size and could be raised in sufficient quantity, they ought to be as useful as mules for carrying baggage and would help to prevent too great a diminution in the numbers of ponies, which might be the result of pushing mule breeding very far.

To return to this subject, many of the Arab donkies are fine animals both in size and shape, and they are all well bred. They require considerable care, being susceptible to cold. All of them are white which is rather objectionable, as they now and then get grey mules. As a rule this is fortunately not the case, most of their stock being dun or brown.

The Bokhara donkies are I believe the very best that can be procured for breeding pack mules adapted to Indian warfare.

They are equally indifferent to heat or cold, have fine frames with plenty of muscular power, are well bred, and usually of the darker colors.

The Punjabi donkies are sometimes very good but are generally smaller than the Bokhara and more coarsely bred.

The native carriers in the Punjab often have in their droves one or two unusually large and good donkies which they keep both for ordinary work and for stallion purposes.

It is doubtless through these that so many good mules are found, the offspring of unbranded mares.

It may interest you to hear the actual measurements of the best specimens of the various breeds of donkies.

These give for Arabs $12-1\frac{1}{2}$ to $12-3$ in height 56 to 58 inches round the chest and $6\frac{3}{4}$ to 7 round the shank.

For Bokharas $12-1$ to $12-2$ in height 55 to 56 inches girth and 7 to $7\frac{1}{2}$ under the knee.

For Punjabi about 12 hands 54 to 55 inches girth and 7 to $7\frac{1}{2}$ round the leg.

For Spanish 13-3 in height 61 to 62 inches girth and $7\frac{1}{4}$ to $7\frac{1}{2}$ under the knee.

The following would probably be the best measures practicable for extending mule breeding throughout India.

1. A large number of donkey stallions should be bought and distributed wherever mares are sufficiently numerous to make use of them. In those parts to which horse breeding operations have not extended, the donkeys should be placed in the hands of the Civil authorities.

2. As the greatest number procurable by Government would not be nearly sufficient for the supply of India, every effort possible should be made, to improve the native breeds of donkeys by covering selected mares with Government stallions. By this means the natives could breed good mules independently of those got by the donkeys belonging to the State.

3. At all Horse fairs and shows good prizes should be given not only for the best mules, but for the best donkeys of both sexes. In districts where full sized horses are not bred, mule and donkey shows should be held.

4. The Superintendents of Horse breeding should at their inspections collect the donkey mares of the districts and brand those with the finest frames, for covering with the Government stallions. Where horse breeding operations are not carried on, the mares might be selected by the Civil authorities in whose charge the donkey stallions are placed. The high prices realized by mules should be published in all districts throughout India where ponies are numerous as was done lately in the breeding districts of the Punjab and North West Provinces by the General Superintendent Horse breeding.

For the past 12 months the system of covering donkey mares has been carried out at Rawalpindi as far as was practicable, 66 mares are now branded and have been covered this season so that it is to be hoped there will, in a few years, be a great improvement in the donkeys of the district. The natives of the Northern Punjab already know fully the value of good donkeys both for work and mule breeding purposes. Last year they repeatedly refused offers of 70 or 80 rupees, which I made them, and this year the only Punjab donkey that I was able to purchase cost 100 rupees. During the past few months natives have bought donkey mares at 60 Rs. each and brought them to be branded and covered by the stallions at the Dépôt.

At the last fair in Rawal Pindi good mules, $13\frac{1}{2}$ hands high and only 3 years old, sold readily for 250 Rs. each, while ponies of the same height and age would not have been worth more than 100.

In spite of these high prices there still exists a great prejudice against mule breeding in the more southerly parts of the Punjab. This is gradually disappearing as the natives realise the advantages to be gained by it.

If such measures as are above suggested be adopted, there appears to me no reason why the supply of mules should not, in time, be equal to any probable demand.

Many of the statements in this paper have been already made at various times in letters to the Punjab Government, but their repetition is unavoidable, in an article designed to lay before the members of this Institution the subject of Indian mule breeding in all its aspects, so far as I am acquainted with them.

J. J. MEYRICK, V. S., R. A.,

Asst. Superintendent Horse breeding, for Punjab.

ABBOTABAD, 21st July, 1879.

VII.

A SCHEME FOR INCREASING THE STRENGTH OF THE NATIVE ARMIES OF THE BENGAL PRESIDENCY ON THE BREAKING OUT OF A WAR EITHER IN EUROPE OR ASIA.

By

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12th Khelat-i-Ghilzie Regiment.

Having written a short paper concerning a reserve for the Native Army, which was printed in the Journal of the United Service Institution Gazette of India for April 1879, I would like to add to this, as since that Paper was written we have had the war just concluded, which has brought out the weak points in organization of the Native Army, so that now when they are fresh on men's minds is just the time to get them corrected.—

I propose considering the Bengal Presidency, and the Native States included in the Presidency, endeavouring to show, how the army might be increased to a very large extent on the breaking out of a war, in either Europe, or Asia.—

The Present Force in the Bengal Presidency and Frontier Force consists of.—

Bengal Cavalry	19 Regiments	...	...	57 Squadrons.
Punjab Frontier Force	5 Regiments	...	...	15 "
Guide Cavalry	...	...	...	2 "
Central India Horse	2 Regiments	...	...	6 "

Total 80 Squadrons.

Native Infantry :—

				Men.
45 Regiments	N. I. 600 strong.	...	...	27,000
4	Ghoorka Regiments 800 strong.	...	...	3,200
10	Frontier Force Regiments 600 strong.	...	...	6,000
Guide Infantry and 5th	Ghoorkas 800 strong.	...	...	1,600
6 Regiments under Government of India	600 strong.			3,600

67 Regiments.—

Total 41,400

The question is, how this force may be best increased in time of war, at a minimum of cost, and still be efficient :—

In my opinion Government should have the power to mobilize double the amount of this force on an emergency :—

My plan is as follows :—

To permanently increase the native army slightly :—

To form two Classes of reserves :—

1st, Reserve for service in the Field :—

2nd, Reserve for service in Garrison :—

In addition to this, I propose that in time of war each Native State should be called on to supply its quota of disciplined men, according to its means.—To do this they must be drilled and disciplined like the Regular Native Army :—

The Increase that I would propose to make would be as follows :—

I would increase 10 Regiments of Cavalry from 3 to 4 Squadrons, making the total available Cavalry of the Regular Army, 90 Squadrons :—

I would augment by 200 men, 19 Regiments of Native Infantry, which would make 25 Regiments 800 strong instead of only 6 Regiments :—

I would make these 25 Regiments consist of 10 Companies each, with the increase in the commissioned and non-commissioned grades :—

I think it will be acknowledged that reserves for Cavalry could scarcely be formed, as there would be a great difficulty about horses, and the Cavalry soldier must be constantly at his work to keep him efficient :—

For the Infantry, I would form a 1st Class reserve consisting of 200 men from each Regiment, men to be of not less than 7 years or over 10 years service on first joining, they would be bound to serve 5 years in the 1st Reserve, and then be transferred to the 2nd Reserve. This could only be formed gradually, and would take 5 or 6 years to complete the number, but when completed it would give us :—

67 Regiments	200 men each	12,400
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I would also form a 2nd Reserve for Garrison duty, of men over 10 years service before being permitted to enter the reserve, to serve at least 7 years before being passed to the Pension Establishment, unless reported physically unfit by an Invaliding Board :—This reserve would later on be chiefly formed, from men transferred from the 1st to the

2nd Class after completing their 5 years service in the 1st Class :—This would give when complete :—

67 Regiments 200 each 13,400

For the training of these reserves, I should propose that the 1st Reserve should be trained for one or two months yearly, as may be considered convenient, and that the 2nd Reserve should assemble for 15 days yearly :—

For the Pay of the Reserves I should propose :—

1st Reserve	...	...	...	...	Rs 3 per mensem.
2nd Reserve	...	...	...	...	Rs 2 per mensem.

I now proceed to a source, from which a large increase may be drawn at no expense to Government :—

A large army exists in embryo, and only requires organization and development to make it a really valuable aid to the Imperial Forces, I mean the Native Tributary States :—

It would be impossible for me to lay down arbitrarily the amount of force each State should keep up, but taking into consideration the Population, Revenue, and the Force now kept up by Native States, a rough calculation could be made, as to the Force which might be expected from each.

I would propose no increase to the armies of Native States, if any thing I should recommend a reduction of a part of their force, and in lieu thereof, attach European officers to the Regiments which they are expected to keep available for immediate service, to the extent of 3 officers Infantry, and 2 cavalry per Regiment. These officers might be a Field officer Commandant, a Captain, Adjutant, and a Subaltern for Infantry, and a Field Officer and Captain or Subaltern for Cavalry :—

The increased expense accruing to each State might be met, by the reduction of a certain number of the remainder of the army :—

I would arm the Regiments so officered with Snider Rifles, a limit being made to the ammunition supplied for practice ; service ammunition would be stored in arsenals.

In the statement annexed at the end of this paper, I give an idea of what might be expected from each State, I have taken the amount of Force kept up by the few States named, as an example, from Colonel Malleson's Book entitled Native States, appendix E pages 392 to 394.

I have put in Bikaner as an example to show that that state might be asked to keep up a camel corps.

The Actual strength which would arise from this source, (Native States) it would be impossible for me to state, but taking Rajpootana, Central India, and the Punjab Chiefs into consideration, I am not I think exaggerating, when I state that it would produce more than 26 Regiments or 78 squadrons cavalry, and 45,000 Infantry.

On the breaking out of a war, when the whole of these arrangements have been completed, the Bengal Presidency, could on an emergency and at very short notice, mobilize a very large army of natives, to be transported to any given point as might be required, or for the defence of the Empire if necessary.

The Force available for Active Service would be as follows:—

	Squadrons.
Regular Cavalry 10 Regts. 4 Squads. each	40
do do 16 Regts. 3 Squads. „	48
Guide Cavalry 2 „ „	2
	<hr/>
Total	90
Cavalry from Native States.	78
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Grand Total	168
Infantry—	
25 Regiments Infantry 1,000 strong. including the 1st reserve.	25,000
42 Regiments Infantry 800 strong including the 1st Reserve.	33,600
Native States, estimated at	45,000
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Total for Service in the Field	103,600
Still in Reserve for Garrison Duty,	
2nd Reserve of 200 men for 67 Regts. 13,400	

If more were required, a certain Number of Pensioners could be called out, and in an extreme case Native States might be called on for one or two more Regiments, for Garrison duty.

If such a scheme were sanctioned, on the breaking out of a war 25 Regiments 800 strong could in a few days be concentrated on any given point, their 1st Reserve following them later on ; they should reach within a month if it was considered necessary to send them to the front.

A force might also be assembled from the nearest Native States of about 10,000 men, which would give a very fair sized Army to commence operations against any Hill tribe requiring coercion.

In addition to this force, there would be Cavalry, European, and Native; if necessary, European Infantry:—and Artillery in the usual proportions. I have not attempted to estimate the cost of this scheme because for even an increase of 100 men to the Native Army, there are so many items under which increased expenditure would come, that it is impossible without getting the information from the several Departments, to even make a guess at it.

I have not entered into the amount of pay for officers attached to Native States, but I should not increase it beyond that of the Regular Army, only charging the state a certain amount extra, to go towards the increase in the Pension List, which would take place from the increased number of officers required for the officering of the Regiments of Native States.—If the Native Armies of Bombay and Madras were increased in this manner, in proportion, they would each supply about 70,000 Infantry, which with Bengal, would be a Native Force from the empire of 243,000 men at least.

I do not think I have over estimated the numbers to be got from the different sources, in fact I think I have largely under estimated the force which, without any extreme pressure, might be raised from Native States.

In the very necessary matter of training for the reserves I have already gone into the method I would propose, in my former paper.

All officers of Native Infantry and Cavalry, will I am sure agree with me in my statement, that an increase in the rank and file of Regiments and of Sowars is a positive necessity to a Regiment, when proceeding on service, for if the duty is severe, which is probable on service, the men only break down, and the Regiment becomes to a certain extent inefficient; the nights in bed, in my opinion, while on service, should be nearly double that considered sufficient for men while on garrison duty. If the duties are severe, the strain tells sooner or later on the men and horses.

If this scheme is objected to on the score of expense, I would rather advocate the disbanding of the necessary number of Regiments, but increasing the number of Squadrons and Companies as proposed, as a Regiment 600 strong is in my opinion, and in the opinion of others, not sufficient for duty in the Field. During the Affghanistan Campaign after two months on Service, I do not think any Regiment could have shown a strength of 400 Sepoys, after deducting the numerous small guards which have to be furnished by the Native Infantry, and which in case of an action could not be counted on, so they might be numbered as ineffectives. I now close this paper hoping that the committee at present assembled, will ask the opinion of officers commanding Regiments which

VIII.

AFGHANISTAN AND ENGLAND IN INDIA.

*Translated by Lieutenant Colonel H. A. Little, Bengal Staff Corps,
from the Non-Official Section of the Militair Wochenblatt, Nos.
45, 46, 47, dated 4th 7th and 11th June, 1879.*

SECTION I.

Perhaps in no year has England provided the military observer with such a profusion of surprises as in the year 1878. The mighty struggle between Russia and Turkey had already reached a decisive turning point at Plevna, when England made the first preparations to mix herself up on her part also in this quarrel by more than diplomatic measures. Her ironclad squadron in the Mediterranean sea, suddenly introduced itself into the Bosphorus through the Dardanelles, and by this means established everywhere at its immediate disposition for a landing, which was perhaps desired, thousands of her sailors. In England itself the mobilisation of the army was ordered, and simultaneously the utmost preparation and strengthening of the war and transport ships was energetically undertaken. Even too in India 10,000 men of the Native Regiments for possible employment on the European battle field were embarked on the 29th April for Malta, while only twelve days previously had the order for the assembly of this force and for the provision of the necessary transports arrived, quite unexpectedly, in Bombay. All these undertakings were without exception and entirely, beyond even the expectation of the English themselves, most successful in their course. The squadron of ironclads since the 24th February, on which day it forced the Dardanelles, performed its duty for over the space of a year in the neighbourhood of Constantinople without a single disturbing incident. All the stations of the English fleet, already occupied during peace by ships of war, were amply reinforced, and two squadrons of ironclads lay in the neighbourhood of the canal ready for an immediate crisis, guaranteeing the complete accomplishment of any blockade which appeared necessary. Amongst the land forces the system of short service inaugurated in 1870, together with the engagement for duty with the reserve coupled with it, proved itself of such a kind that ninety eight per cent of the army service men and ninety five per cent of the Militia reserve men presented themselves without delay on the 19th April; and by this means 34,786 fully trained men were added to the army, which hitherto was dependent for its com-

pletion only on recruiting. After eight weeks, two army corps of war strength, were at immediate disposal for foreign service. The native regiments of India chosen manifestly only with a view to the distribution of the army, and taken away from where at the moment a garrison appeared unnecessary, thus at all events not picked troops, arrived in the best moral and physical condition on the 4th June at Malta, the first attempt to employ the soldiers of India in Europe. A further surprise, the convention between England and Turkey of the 4th May 1878 with regard to the cession of Cyprus, led this Malta Division, which had been drawn from India, to the island just named on the 10th July, to effect the formal taking possession of it. When in consequence of the favorable result of the Berlin Congress the return of these troops to India took place, the twenty eight ships of the merchant fleet showed themselves at their best during the three weeks voyage, just as did the Suez Canal used now for the first time for a military object. The soldier of India had during this expedition not only justified the confidence of his Empress in him, but also had rendered service to the special interests of India. For the chief value of Cyprus does not consist in its possible employment as a place of arms in the Mediterranean Sea (since Malta was that long since when there was a victorious concourse there,) but as a basis for the project, several years old, of the Euphrates valley line, and still more in its covering the Suez canal, that vital artery (owing to the acquisition of the Suez Canal shares and to the recent annexation of Socotra) of the commerce of England with India, which now for the first time was completely drawn within the sphere of England's power. The division from Malta returned precisely at the right time to find still employment, in part at least, by the last proceeding of England in the spring, the expedition against Afghanistan.

Afghanistan has in this century already seen various English expeditions of this kind, under the most diverse circumstances. Their object was always to re-establish or to strengthen the preponderance of the influence of England there, so to say, the uniting of Afghanistan to the Anglo-Indian system, which means not annexation but the maximum of political influence and the minimum of annexation. Afghanistan has its importance only as being a country which is a thoroughfare to British India. It is as such that it has been fought for at all times by the most different nations. Through Afghanistan the great high road for nations conducts to the treasures of India. On the other hand, treasures are not to be found in Afghanistan itself. The great conquerors, such as Ghengis Khan and Timur have to this day left behind conspicuous traces of their formidable devastations there. Afghanistan has seen occasions when the mortar of their buildings has been moistened by the conquerors with the blood of the inhabitants. The formerly flourishing emporiums of Kandahar, Herat, Ghuzni, have very much declined since the discovery of the sea route to the East Indies; and the culture of the people of Asia is altogether of a descending scale. Only long years of a regulated Government could bring back the

early condition of prosperity, and make conspicuous the treasures in the mountains of Afghanistan.

Afghanistan as the eastern portion of the Iranian highlands is a land of mountains : four fifths of it consists of mountains which form a great elevated plateau. Lying between the 61st. and 71st. degrees of latitude and the 30th and 37th degrees of longitude, they separate it in the north from Bokhara, friendly to Russia, and from Turkestan, which is half Russian, as well as from the mountain bastions of the Punjab of British India ; while in the west, pathless ranges of heights, devoid of vegetation, the salt desert of Persia, form the boundaries towards Persia, and in the south, the desert of Biluchi leads to the conglomerate of states of Biluchistan.

The political boundaries of Afghanistan cannot be defined with certainty. On the east the boundaries towards Kafiristan and the independent hill tribes are quite insecure. In the north the Oxus forms the boundary, as it has been fully acknowledged officially on the part of Russia in 1872. In the same year the west boundary towards Biluchistan and Persian Seistan was laid down by arbitration.

Thus the number of the inhabitants has been only superficially estimated. In Afghanistan proper, with Kabul as its capital, there live about $4\frac{1}{2}$ millions, in Herat $1\frac{1}{2}$ millions, and in Kandahar 2 millions of inhabitants ; so that upon an area about equal to the Kingdom of Germany there are to be reckoned in Afghanistan about 8 millions of inhabitants.

The grouping of the mountains of Afghanistan exhibits a configuration, radiating from the Koh-i-Baba, 17,000 feet high, of the tributary mountain ranges or rather valleys of the Hindu Kush, Safed Koh, Suliman, Amran, Aimak and Hazara mountains. These mountain ranges divide Kandahar (in the basin of the Helmund), Herat (in the basin of the Har-i-Rud), Kabul (in the basin of the Kabul), and Balkh (in the basin of the Oxus) from one another.

Afghanistan is richly watered, but has no navigable river besides the Helmund, which empties itself into the tideless swamp of Hamun. From time to time a portion of these rivers even dry up. The many water courses struggling towards the Indus, which burst through the Suliman range, form the only connection with the sea. They have created the passes which lead from the basin of the Indus to the high table land of Afghanistan, such as the Khaiber, Kuram and Gomul passes. These passes are not to be likened to those existing amongst us in Europe as they are much longer and offer greater difficulties for their utilisation for military purposes, as the followers of troops in India amount to double and three fold the number of the combatants, frequently have to travel several days through regions which cannot contribute in the very least in water, wood or supplies to the requirements of

an army ; and finally their fitness for use depends upon the attitude which the wild tribes living there assume, and which frequently makes negotiations, which waste valuable time, indispensable.

The roads, which are few and difficult, are in bad order. The only good road which has been constructed is the one which leads from Kandahar to Herat, and next to it may be mentioned the road connecting Kandahar and Quetta. This is confined to a short description of the roads which were used in the operations of the English up to this time, during the years 1839—1842 and 1878 to 1879. In 1839 the average daily march which the English made was at most twelve miles. Starting from Sukkur on the 14th February the march followed the Indus along the caravan route, which was chiefly used for trade purposes, through the wide plains, which were at first destitute of trees and then fertile, till Dadur was reached, lying at the southern entrance to the Bolan Pass. This Bolan Pass, which is twelve miles long, is the old road of the Mahomedans to India. Through its defiles the road leads to Quetta, which is thirty-five miles distant, which has, since 1876, on the grounds of the English protectorate of Kelat undertaken in the year 1854, an English garrison. The next twenty six miles lead through the fertile valley of Pishin, passing the fort of Abdullah Kila, situated in a desert steppe-like plain up to the wooded heights of the Amran mountains and through the Khojak Pass to Kandahar. The crossing the Khojak Pass offers no difficulties, as here is wood and water on the heights of the Pass, which out-top the great St. Gothard, and the tribes inhabiting the country from Quetta to Kandahar are peaceful. The continuation of the route leads by several parallel roads, which are in good order, and about two miles distant from each other through plains to Kandahar, sixteen miles distant from the Khojak Pass, with an altitude of only 3,500 feet. There the English, who in consequence of the want of water and forage, from which they had suffered south of Quetta, had lost almost the whole of their trains, recovered themselves, and reached the capital, Kabul, by Khelat-i-Ghilzai and Ghuzni. From here a portion of the invading army marched by the extremely troublesome route, thirty miles in length, through the valley of Kabul to Peshawar. Especially at the commencement a most dreary region, a naked wilderness of staring hills and of high inaccessible mountains had to be passed. The road climbs up and down, leads over high mountain ridges and seven times through narrow passes. The road is rendered more difficult by the blocks of flint stones and rocks covering it. Two miles east of Kabul commences the Khurd Kabul Pass, one mile in length, which in the year 1841 was so disastrous to the English. The ascent up to the heights of the Khaiber Pass, which are 3,370 feet high, amounts at Lundi Khana to 1,700 feet, and is the most difficult part, as frequently there is only a width of 12 feet between the rocks and the precipice. The Khaiber Pass, which forms the watershed between the valleys of Peshawar and Jellalabad, is well supplied with water throughout its entire length of six miles, and is practicable for all arms. In

the middle of the Pass stands the barrier fort of Ali Musjid, upon an isolated rock, which is one hundred and fifty feet in length and sixty feet in breadth. If the heights are occupied by one's own troops, the passage of the Pass can always be effected with safety; and this occupation can be easily carried out, as it is known by experience that the Mahomedans if attacked resolutely, are easily made apprehensive for their line of retreat and then abandon immediately the strongest positions. For the situation in Afghanistan this route is fitly mentioned, and has also been utilised by the English with the greatest and best result. It runs chiefly through a most productive country. It is now indeed already clear that in case the English should see themselves forced to further operations against Yakub Khan, the advance towards Kabul will be begun by this route in order to dictate the terms of peace at that place. The road leading about six miles to the south of the British frontier fort of Thull up the Kuram Valley, past the Afghan fort of Mahomed Azim by the Logar Valley to Kabul, is indeed shorter but offers considerable difficulties to operations of any great extent. The first eight miles from Thull to the Peiwar Kotal are practicable for marching, the next ten miles to Kushi are extremely bad. The five days march over the Shutargurdan Pass offer great difficulties as to supplies, because the narrow stony road is impassable for carts. The positions on the Peiwar and Shutargurdan Passes are easily defended against an adversary and the dangerous Ghilzais inhabit this stretch of country. From Kushi to Kabul there are still five days further march. General Roberts has been despatched into this difficult country probably only to occupy this important and productive province, and to attract to him a portion of the enemy's army, so as to facilitate General Browne's task in the Kabul Valley and finally to curb the powerful Afridis of the Khaiber Pass by continually threatening them in flank. If even the light guns are transported upon mules and the heavy guns upon elephants, then a force consisting of all arms, provided with with a train sufficient for independent action will scarcely advance to Kabul over the Shutargurdan Pass.

As already intimated, in forming an opinion of the difficulty of penetrating by a particular route, the population dwelling on it becomes in this case of the greatest importance. Afghanistan is a genuine stronghold of different nations, into which in the progress of time an ever fresh heterogeneous accession has found admittance. The strongholds of the German self-protecting federations in the middle ages are here illustrated on a large scale. Thus, the Duranis, Tajiks, Yusafzais, Ghilzais, Eimaks, Hazaris, Kafirs, Hindus, Jats, Arabs, Kizilbashis, Uzbeks, Biluchis, find themselves near neighbours. Of these about three millions may be real Afghans, who profess the Suni faith and speak Indo-Persian Pushtu. They divide into races of note, who mostly can speak Persian as the Duranis and Ghilzais, and into inferior clans, as amongst others the Afridis. There are on the whole over four hundred inferior tribes known. The family of the Amir belongs to the Duranis, who are numerically strong and divided

into five secondary tribes. They live in the South of Afghanistan, especially in the neighbourhood of Kandahar. The next most powerful tribe is the Ghilzais who are estimated at 30,000 fighting men, and live nearly in the triangle, Kabul, Jellalabad, Khelat-i-Ghilzai. They were till 1747 the ruling race, because the royal family till then belonged to them. General Browne has to deal with the Ghilzais, the more so because they are the bravest and most daring of the Afghans. To the south of the Ghilzais live too the Pushtuspeaking races, who chiefly defend only their own territory, 20,000 warlike Kakars, 6,000 Tarins &c. With them General Biddulph has been in contact at Kandahar. The mountainous eastern border is almost without exception inhabited by these races, which have never yet been subdued who claim complete independence, such as the Momunds, Afridis, Arakzais, Zymukts, Waziris. Their sense of independence does not however prevent them from attesting their friendship only for ready money. This idiosyncrasy explains then too the business for which the office of a political officer, also of a political military agent, has been created on the part of the English. On the watershed of the Helmund and the Indus dwell too the independent races of Pathans and Biluchis. The Persianspeaking Kazilbashis in Kabal itself comprise 3 millions of Shiahhs who are not Afghans, many of whose 30,000 fighting men are in the Amir's regular Cavalry and Artillery. The Tajiks, about 10,000 men, are chiefly in the Kabul and Ghazni districts; the Hazaris are in the Hazara mountains, where still they maintain their independence. Finally, there is a million of the inhabitants of Turkey, Persia, India, Armenia and Kafirstan. The latter are Hindus, and violent antagonists of the Mahomedans living around them: their Kafirstan is independent of Afghanistan,

The Afghans appear first at the end of the twelfth century, when they shook off the rule of the Turcomans. In the three following centuries they extended their rule as far as Hindustan. But in the 16th and 17th centuries they made good their independence against the Mongolians and Persians, only in the inaccessible part of the country. In the beginning of the 18th century the Ghilzais became the liberators of their people from the Persian yoke, and consequently ruled over Persia till 1729, which then on its side again ruled over Afghanistan till 1747. Then the Duranis under Ahmed Shah Abdali united the different Afghan races and conquered the Punjab and Kashmir. The descendants of this Ahmed ruled till this century, when Dost Mahomed, the son of an Afghan Minister, ascended the throne, and in the possession indeed of it, though certainly after many alternating vicissitudes, he died on the 9th June 1863. His second son and successor, the latter after many fights, was the lately deceased Amir Shere Ali, whose heritage has not up to this been entered on definitely by any one. Yakub Khan, certainly appears to be appointed as his successor, and it is true with the resolve that after his death the sovereign authority is to pass to Ahmed Ali Khan, who is now eighteen year's old. However, a dynasty has always fallen into ruins so soon as it has not the influence to establish a strong representative who is capable of governing. Energy,

popularity, ability to rule have in that country always been decisive as to the throne, not consideration for the recognised right of descent and succession. Asia is an empire of mutability, as easy and swift as is the acquisition so is the maintenance of power difficult: neither a great empire extended over a large part of the world nor small governments can strengthen themselves lastingly. There is perpetual change, as in the desert with its mirages and marshes.

When the geography of the country is considered and its history as connected therewith, when the miscellaneous medley of descent and religion is reflected on, then it cannot be a subject of any wonder that in this nomadic kingdom, the inhabitants of which are only partly united by a common language, as by a single bond, a homogeneous constitution is not practicable. Afghanistan is, it is true, governed by a prince, but not for that reason in the remotest degree is it a monarchy in our sense of the word. This is much more a dictatorship for the duration of a life over a military aristocracy intermixed with insignificant republics. The Sirdars rule in their own districts entirely according to their own discretion, and are kept in subjection towards the ruler only by means of their own dissensions and mutual jealousy. As everything depends upon the independent resolution of the chiefs, who recognise no law, and in time of war or peace without hesitation change sides solely and only as a money speculation, not probably from liking or disliking, so union and constancy is not possible. An old Afghan gave his opinion therefore, when the advantages of a strong kinhood as regarded peace and security were demonstrated to him.—“We are contented in the midst of disunion, disturbance and bloodshedding; but we would never feel contented under a master.” Under such circumstances it is natural that the character of the people is described as treacherous, faithless to their word, greedy, brave, but at the same time easily discouraged at the first reverse. The Afghan, who endeavours to give the best entertainment to his guest in his own house, will be immediately ready to shoot that guest as soon as he has left the house, and in case his property is considered worth being desired by him. His muscular and symmetrical physical build makes of the Afghan an able hunter and excellent horseman, as which he has indeed often already been formidable to his adversary on the field of battle. But this character of the people, the endless private feuds and the tribal jealousies occasion not only great difficulties to the adversary's carrying on the war, but also obstruct the conclusion of peace and the maintenance of the lasting influence which the English wish to secure for themselves there, as being indispensable. Upon the choice of suitable terms of peace much more depends in the present case than upon the individuality of the military operations.

For both nations, the recollection of the previous visits of the English to Afghanistan, both the friendly and the hostile ones, will be of use; and on this account a brief mention must necessarily here be

be made of them. At first, in consequence of the game of intrigue which Napoleon I. had commenced in Persia against England, Mountstuart Elphinstone was despatched in 1809 to the then Shah Sujah and received the most cordial reception at Peshawur. But Shah Sujah was in 1810 turned out by his brother Mahmud, and the latter was pressed hard by the son of his Wazir to such a degree, that Herat alone remained to him; while Dost Mahomed in 1826 ruled over Kabul, Peshawur, Ghuzni and Kandahar, Peshawur was in 1831 lost to the King, Runjit Sing, the Lion of the Punjab. Hereupon Dost Mahomed applied for the assistance of England to recover Peshawur, failing which he would unite himself with Russia for this object. As Russia at this time appeared threatening to the English because 40,000 Persians, presumably through Russian influence and commanded by Russian and French officers, made an attack upon Herat in 1837, and on 22nd November of that year commenced a regular siege of the town of Herat; therefore the English under Lord Auckland as Governor General determined upon an expedition into Afghanistan, in order to again establish as Amir in Kabul, in the place of Dost Mahomed, Shah Sujah-ul-Mulk, who was dependent upon them, and had fled to Lahore in 1810, and in 1818 to Ludiana. Sir A. Burnes had since December 1837 been ambassador at Kabul to no purpose, and left in April 1838, quitting the field there for the Russian Agent Vidkovitch. In March 1838 the Army of the Indus, 21,000 men strong, 6,000 of whom were English, assembled. On the 11th October a declaration of war followed, and on the 10th December of that year the move of the army from the camp at Ferozepore, under Sir Henry Fane who was in chief command; although the defence of Herat conducted for the Afghans by the English Major of Artillery Sir Eldred Pottinger had already forced the Persians, on the 8th September 1835, who were commanded by the Russian General Borowski, (there was also a Russian Battalion of volunteers there) to give up the siege, which had lasted for ten months.

The alliance between Russia, Persia and Afghanistan had therefore actually come to an end. At the end of March 1839, 9,500 men of the army of Bengal, under General Willoughby Cotton, assembled at Quetta, together with 5,600 men of a division from Bombay, and 6,000 Hindustanis of Shah Sujah under Sir John Keane, who held the chief command. In addition 5,000 Sikhs and other auxiliary troops under Captain Wade were to advance to Kabul from Peshawur.

As the Khan of Kandahar, without making a fight, fled away to Persia, that town was occupied on the 28th April 1839, and the Sultan Shah Sujah was there enthroned.

The first battle took place just as the further advance to Kabul by Ghuzni was commenced on the 27th June. After a delay of two days Ghuzni, which had been considered impregnable, was taken by storm on the 23rd July, by a British force 12,000 men strong, with forty field guns with its garrison of 3,000 men, and the upstart

Mahomed Haider Khan, the Governor, the son of the Amir Dost Mahomed; after which a gate of the citadel was successfully blown open by a bag of powder, which was attached to it. This victory cost only 17 killed and 165 wounded. The fall of Ghuzni, which had been provisioned sufficiently for twelve months, led to the flight of Dost Mahomed to Bokhara, and to the occupation without opposition of Kabul, which latter occurred on the 7th August 1839.

This march from Ferozepore, which had with one exception been a peaceful one, and almost undisturbed, through Rori, Sukkur, Quetta, Kandahar and Ghuzni to Kabul, had attained what was specially the primary object: namely, to establish Shah Sujah-ul-Mulk once more upon the throne. The English had not in consequence been spared experiencing all the difficulties and labors, which the operations of a large column of an army, and above all, the advance of its baggage render inevitable in a country like Afghanistan.

The army employed three and a half months in moving from Kandahar to Kabul, which was* sixty miles distant; and of this two days only were lost before Ghuzni! This line of advance was, then, despite of everything, the least hazardous of all it offered certainly some difficulties as regards supplies in the mountainous parts of it, but the road was suitable for all arms, and neither Sir John Keane in the summer of 1839, nor General Nott in the summer of 1842 met any opposition on it. Briefly, from this advance on that visit the English drew false conclusions, and the final result was the complete loss of an entire army and the return of Dost Mahomed from Kurnaul to his throne.

Already, on the 3rd September 1839, Sir John Keane had commenced with the larger half of the expeditionary force his march back to India, through the valley of the Kabul and the Khaiber Pass. On the other hand, Captain Wade with 5,000 Pathans only marched on the 21st July 1839 from Peshawur, captured the Fort of Ali Musjid on the 26th July with a loss of one hundred and eighty killed and wounded, and unopposed reached Kabul on the 8th September. Only 8,000 men remained behind in Afghanistan to support the Government of Shah Sujah, and to add weight to the advice of Sir William Macnaghten, the accredited ambassador and of the agent Alexander Burnes.

Till the autumn of 1841 the situation continued exceptionally favorable. Dost Mahomed, after two futile attempts to recover his sovereign authority, had surrendered on the 3rd November 1840, and had been brought as a prisoner to India, with an annual allowance of 600,000 marks. An insurrection of the Ghilzais, which had been excited by the continued occupation by the English of Khelat-i-Ghilzai, was crushed

* Kandahar to Ghuzni is 230 English miles and Ghuzni to Kabul 88 English miles. In 1839 the army marched from Kandahar on the 27th June reaching Ghuzni on the 21st July in 22nd marches; it advanced from Ghuzni on the 30th July arriving at Kabul on the 6th August in 7th marches.—(*Translator's Note.*)

in August of 1840. In July of the same year Akbar Khan, the son of Dost Mahomed, who had become troublesome with 7,000 horse-men and infantry, west of Kandahar, had been defeated at Girishk by three Afghan regiments; so that in April 1841 Major General Elphinstone took over the military command in Afghanistan in the most complete tranquillity.

This apparent security and his failing health prevented, his rectifying the defects in the position of the British camp at Kabul, his strengthening the detached inland posts, although urgent representations were made to him on the subject, and his drawing the attention of Shah Sujah to his faulty government. So then unexpected evil approached the English, who were not prepared in anticipation of it, who had allowed their families to follow them, played cricket, skated and in short lived as in the time of peace. In October 1841 three Ghilzai chiefs fortified the Khurd Kabul defile, two miles east of Kabul, and barred the nearest road to India. On the 11th October General Sale had to capture the stone breastworks in this narrow defile and the redoubt in the Khurd Kabul, Pass and on the 22nd October to advance to Tezin in order to open the road to Peshawar.

In consequence of the insurrection which broke out in Kabul itself, on the 2nd November, which was initiated by the murder of the agent Alexander Burnes, and assumed very quickly large proportions owing to the dilatory mode of action of General Elphinstone, the detachment of troops was ordered back from Tezin, and with difficulty reached the British camp at Kabul. General Sale's main body could no longer carry out the orders issued: just as little could the troops ordered from Kandahar to Kabul. General Sale however defended himself successfully, despite of want of supplies and ammunition, at Jellalabad during full five months; and so too was Kandahar held by the British garrison at that place; while the garrison of Ghuzni, which was surrendered to the insurgents on the 23rd December 1841, was massacred; and in other garrisons, as Charikar in Kohistan, the British Officers were killed by their own men. Shah Sujah was besieged in his palace, in the Bala Hissar; the English in their camp without having any safe road of communication with the Bala Hissar in the citadel. The commissariat fort in Kabul, with all the stores, was already on the 4th November given over into the possession of the insurgents. The sortie of Brigadier Shelton on the 23rd November ended in a defeat, the Ambassador Sir William Macnaghten who had already in his pocket his nomination as Governor of Bombay, was murdered on the 23rd December 1841, at a conference with Akbar Khan by the latter, with his own hand with a pistol presented to him the day before by Macnaghten; and consequently General Elphinstone, who was ill, and at the moment of the outbreak had been on the point of leaving from considerations of health, was referred altogether more and more to his own irresolution. There was finally nothing left, when on 6th January 1842 a convention was concluded with the faithless Akbar Khan, which delivered up the camp;

and for this he was to ensure to 5,400 soldiers, 600 of whom were Europeans, and to 12,000 followers a retreat unimpeded, and subsistence as far as the frontier of India.

On the 8th January the movement on Jellalabad was actually commenced, but in consequence of the cold, of the supplies not being provided, and of the incessant attacks by the Afghans on these unfortunates, half dead with cold and hunger, there were at Gundamak on the 13th January only twenty combatants alive. The cartridge pouches were used at this time of horror for fuel, and the loathing for taking human flesh dissipated. One single person of all those who had left Kabul, Dr. Brydon, came wounded and half dead to Jellalabad, and subsequently there were ninety five prisoners in addition liberated from Bamian. All the remainder lost their lives, that is to say, six regiments of infantry, three companies of sappers, one division of European Artillery, half a mountain battery, almost an entire regiment of Regular Cavalry, more than one hundred British Officers. The chief fault of the English consisted in this: that they had pressed Afghanistan upon a ruler, and yet in him there was an individuality so unsuitable that they then acquiesced in keeping British troops in the country to protect this ruler, and that they did not adapt these measures to the circumstances there existing. The number of the troops left behind was far too weak for the task assigned them; only 8,000 men for keeping the command of a mountainous country destitute of roads, of the size of Germany! In this way there was no provision made for the security of the line of communication with India. On the other hand, there were only insufficient supplies of provisions and of munitions stored up, and besides this in such a way that they were already in the power of the adversary two days after the commencement of the outbreak. So the catastrophe declared itself, which was certainly much accelerated and heightened by the severity of the winter, by the want of ability of those managing matters, and by their false confidence in the faithless Afghans. The English had drawn upon themselves the hatred of the population chiefly by this, that they had devoted their troops to collecting the taxes for the Amir, and had not hindered the latter in reducing suddenly the annual pension of the chiefs of the Ghilzai's or the subsidies. The amorous intrigues of the English must too have embittered the Afghans. The fault was however soon again outwardly made amends for. Already, on the 16th April 1842 General Pollock had effected a junction at Jellalabad with the troops of General Sale, which still numbered 1,400 men, after he had forced the Khaiber Pass with a brigade of 8,000 men strong: on the 20th August the advance from Jellalabad to Kabul, which had been delayed for want of camels, was commenced and that place was reached on the 15th September, after a victorious fight at Tezin with Akbar Khan. The British standard once more waved triumphantly from the Bala Hissar in Kabul. Two days later General Nott also arrived there with 7,000 men, after that he on his advance from Kandahar had recaptured Khelat-i-Ghilzai, which is a place of strength, and Ghuzni. As Shah Sujah was

murdered, and the impracticability of intermeddling in the internal affairs of Afghanistan had been made apparent, the English in December 1842 evacuated the whole country, since they were satisfied with their military success. Dost Mahomed governed it till his death, and the English made no opposition when the assassin Akbar Khan was appointed to the office of Wazir. In consequence of the Sikh insurrection Dost Mahomed crossed the eastern frontier, sent a corps of Cavalry 2,000 men strong to the aid of the Sikhs, and was present at the battle of Gujrat on the 21st February 1849, where the swiftness of his horse alone saved him from the cavalry of Sir Walter Raleigh Gilbert, who pursued him. In January 1855 a friendly interview took place between Haider Khan, the son of Dost Mahomed, and the English, which led to the peace of Peshawar. After the Dost had reconquered Balkh in 1850, and gained Kandahar by inheritance in 1855, the Persians again won Herat from him in 1856. The conference renewed in January 1857 between the Dost and Sir J. Lawrence at Peshawar secured to the former subsidies of arms and money against Persia, who in March 1857 bound herself to England at Paris to renounce all claims to Herat. Dost Mahomed in truth remained faithful to England during the whole duration of the formidable mutiny in India, strengthened in this course by the British Ambassador Major Lumsden. In 1863 the Dost conquered Herat, after a siege of ten months, but survived this success only thirteen days.

SECTION. II.

The usual struggle now commenced between the sons of Dost Mahomed regarding the succession and only in 1868 did Shere Ali come forth from it as the acknowledged victor. Lord Mayo the successor of Sir John Lawrence had a memorable conference with Amir Shere Ali in April 1869. From it however there resulted only assurances of friendship, an adjustment of the arrears of the subsidy due, and presents of guns and rifles, but no definite agreement. The Amir entered more and more into explanations with Russia as his representations regarding the advance of Russia, specially after the occupation of Khiva in the year 1873, elicited no positive promises from Lord Northbrook, who was then Viceroy. In 1876 at the solemn proclamation of Queen Victoria, as Empress of India, Shere Ali was conspicuous by his absence. On the other hand, although he had persistently prevented the presence of an English Agent in Kabul, he received officially a Russian embassy at a moment when a conflict between Russia and England was imminent.

Thus circumstances forced him to decide upon war, which however might have been avoided, had the policy of the liberal Ministry, in office up to the year 1875, been more decided and more definite in its aim, instead of acquiring for itself the title of "Masterly inactivity." For it was not the original complications of his father with England, which drove Shere Ali into the arms of the opposite party,—Dost Mahomed had in truth died, a proved friend of the English; nor had the passive conduct and attitude of England during his struggle alienated Shere Ali,—in 1869 he had been in person at Umballa for the purpose of concluding an alliance and had with the same object again sent an envoy in 1873; nor did England's award concerning the possession of Seistan which resulted in 1872 in favor of Persia, nor the pretended protection by the English of his son Yakub Khan whom he had imprisoned, cause Shere Ali to glance towards Russia,—for Persia was an old ally of Russia, so the latter would certainly not be willing to reverse the award, and as Yakub Khan appeared so dangerous to him, Shere Ali's only anxiety was to banish him by the shortest process; nor finally could the occupation by the English of Quetta in the year 1876 bring him to think of war,—as it consisted only of one battalion of the Indian Army one Mountain Battery and some cavalry, and was based on a treaty previously concluded with Kelat in 1854, which was pointed against Persia, and Russia standing behind her. Shere Ali's decision originated from the conviction, that England would not protect him against Russia under all circumstances, that on the other hand, the time to make choice between Russia and England was now pressing, and that Russia was so powerful, that no longer could Afghanistan withdraw herself from Russia's influence. Therefore the Russian embassy was received by him.

What was said and promised to him by it is buried in his grave with the dead Amir. It appears however a permissible assumption, that on the part of General Kaufmaun, Governor General of the Russian Military District of Turkistan a communication was made to the Amir in Kabul, that movable columns would be put in motion towards Merv, and Balkh.

In May 1878 the troops at the disposition of General Kaufmaun received an order, in which was included the formation of three movable columns, as well as a variety of regulations in detail, regarding their conduct on the line of march. The principal column, consisting of 9,000 infantry, 2,000 cavalry, 44 guns, and, rocket battery with 1,200 gunners was to assemble at Samarkand, and to move upon Djam (Dscham), Andjerli, and Sarykul, on the frontier of Bokhara. A second column the so called Ferghana detachment, (1440 men, 280 horses, 1 horse mountain battery with 6 guns and half a rocket battery) was to assemble in Margelan, so as to march by Wadil into the Risil-Su Valley. The third column, 1440 infantry 280 horses, 100 gunners and 4 guns, from the Amu Darya district was to concentrate at Petro Alexandrovsk, in order, as the Amu Darya column, to advance along the Amu Darya to Tschardschni. Of the three columns above named General Kaufmaun in person assumed the chief command, and appointed his staff consisting of thirty officers. The columns were to receive subsequent orders as to the intended objective.

At the end of June 1878 all these three columns were put in motion, but nothing had transpired regarding the objective mentioned. In August, just after the Berlin congress, the principal Russian movable column, which had been formed on the frontier of Turkestan in the direction of the Amu Darya, received an order for its countermarch from Djam, Andjerli, and Sarykul, to its usual garrisons.

About the same time a Russian expedition, of at most 1,500 men strong, had set out from Krasnovodsk, under the command of General Lomakin, in order to advance by the Caspian Sea, the Atrek, and along the Persian frontier towards Merv. The plundering Turcomans were to be punished for their molestation of the borders of Khiva, and of the commerce with Persia.

These four columns, which were put in motion in the summer of 1878 upon Merv, or rather towards Balkh, together amounted to about 18,000 men and 60 guns. If these Russian troops were taken along with the estimate of his own strength, could Shere Ali be in any doubt when he did not reply to letter of the Viceroy in August 1878, and caused the English Mission to be definitely sent back on the 21st September, at the frontier fort of Ali-Musjid? The British Ultimatum, issued in consequence of this last act, remained unanswered on the 20th November, the final limit, and consequently the Anglo-Indian Columns crossed the frontier.

ORDRE DE BATAILLE.
OF THE ENGLISH TROOPS MOBILISED FOR THE CAMPAIGN
OF 1878-79 AGAINST AFGHANISTAN.—

COMMANDER-IN-CHIEF: GENERAL SIR F. P. HAINES.—

KHAIBER (PESHAWUR) COLUMN.

COMMANDER: GENERAL SIR F. P. HAINES.

1st Division.

LIEUTENANT GENERAL SIR S. J. BROWNE.

1st Infantry Brigade.

BRIGADIER GENERAL H. T. MACPHERSON.

4th Battalion Rifle Brigade. 20th Bengal Native Infantry.
4th Goorkhas, Infantry.

2nd Infantry Brigade.

BRIGADIER GENERAL J. A. TYTLER.

1-17th Infantry. Corps of Guides, Infantry.
1st Sikh Infantry.

3rd Infantry Brigade.

BRIGADIER GENERAL F. C. APPLEYARD.

81st Infantry. 14th Bengal Native Infantry (Sikhs).
27th Bengal Native Infantry.

4th Infantry Brigade.

BRIGADIER GENERAL W. B. BROWNE.

51st Infantry. 6th Bengal Navtie Infantry.
45th Bengal Native Infantry, (Sikhs).

Cavalry Brigade.

COLONEL C. J. S. GOUGH.

10th Hussars (2 squadrons). 11th Bengal Cavalry, (Lancers).
Corps of Guides, Cavalry.

Artillery.

COLONEL W. J. WILLIAMS.

I. Battery C. Brigade.	4th Punjab Mountain Battery.
E. Battery 3rd Brigade.	(Mountain Battery with mules).
11 Battery 9th Brigade,	
13 Battery 9th Brigade.	

Engineers.

COLONEL F. R. MAUNSEL.

2nd Company Bengal Sappers and Miners.
3rd Company Bengal Sappers and Miners.
6th Company Bengal Sappers and Miners.
8th Company Bengal Sappers and Miners.
Engineer's Field Park.

2nd Division.

LIEUTENANT GENERAL F. F. MAUDE.

1st Infantry Brigade.

BRIGADIER GENERAL F. S. BLYTH.

1-25th Infantry.	24th Bengal Native Infantry.
	Bhopal Battalion.

2nd Infantry Brigade.

BRIGADIER GENERAL J. DORAN.

1-5th Infantry (Fusiliers).	2nd Sirmoor Goorkhas, Infantry.
	Mhairwarra Battalion.

Cavalry Brigade.

BRIGADIER GENERAL I. E. MICHELL.

9th Lancers.	10th Bengal Cavalry (Lancers).
	13th Bengal Cavalry (Lancers).

Artillery.

D. Battery A. Brigade.
H. Battery C. Brigade.
C. Battery 3rd Brigade.

Engineers.

G. Company Madras Sappers and Miners.

H. Company Madras Sappers and Miners.

KURAM COLUMN.

COMMANDER: MAJOR GENERAL F. S. ROBERTS.

1st Infantry Brigade.

BRIGADIER GENERAL A. H. COBBE.

2-8th Infantry.

29th Punjab Native Infantry.

5th Punjab Infantry.

2nd Infantry Brigade.

BRIGADIER GENERAL J. B. THELWALL.

72nd Infantry (Highlanders)

21st Bengal Native Infantry.

23rd Bengal Native Infantry (Pioneers).

5th Goorkhas Infantry.

2nd Punjab Infantry.

Cavalry Brigade.

COLONEL H. GOUGH.

10th Hussars (1 squadron)

12th Bengal Cavalry.

Artillery.

LIEUTENANT COLONEL A. H. LINDSAY.

F. Battery A. Brigade (with Elephants.) 1st Punjab Mountain Battery.

2nd Punjab Mountain Battery.

Engineers.

7th Company Bengal Sappers and Miners.

Engineers' Field Park.—

Reserve Division.

MAJOR GENERAL WATSON.

With the Contingent of the Native Princes of India with a total of 4,000 Irregulars, consisting of 2,500 Infantry, 1,000 Cavalry men and fifteen guns.

BOLAN (MULTAN) COLUMN.

LIEUTENANT GENERAL D. M. STEWART.

1st Infantry Brigade.

BRIGADIER GENERAL R. BARTER.

2-60th Infantry Rifle Corps. 15th Bengal Native Infantry.
25th Bengal Native Infantry.

2nd Infantry Brigade.

BRIGADIER GENERAL R. J. HUGHES.

59th Infantry Regiment. 12th Bengal Native Infantry.
1st Goorkhas, Infantry.
3rd Goorkhas, Infantry.

Cavalry Brigade.

15th Hussars. 8th Bengal Cavalry.
19th Bengal Cavalry (Lancers)

Artillery.

BRIGADIER GENERAL C. G. ARBUTHNOT.

A. Battery	...	B. Brigade.	
I. Battery	...	1st Brigade.	
D. Battery	...	2nd Brigade.	
G. Battery	...	4th Brigade.	
5th Battery	...	11th Brigade. (Heavy)	
6th Battery	...	6th Brigade.	
8th Battery	...	11th Brigade.	} Siege Park.
13th Battery	...	8th Brigade.	
16th Battery	...	8th Brigade.	
11th Battery	...	11th Brigade. (Mountain Battery).	

Engineers.

COLONEL R. H. SANKEY.

4th Company Bengal Sappers and Miners.
9th Company Bengal Sappers and Miners.
10th Company Bengal Sappers and Miners,
with Engineer train and Engineer Field Park.

2nd Division (Quetta.)

MAJOR GENERAL M. A. S. BIDDULPH.

1st Infantry Brigade.

70th Infantry Regiment. 19th Bengal Native Infantry.
30th Bombay Native Infantry.

2nd Infantry Brigade.

BRIGADIER GENERAL T. NUTTALL.

26th Bengal Native Infantry.
32nd Bengal Native Infantry. (Pioneers)
1st Punjab Infantry.
29th Bombay Native Infantry. (2nd Biluchis).

Cavalry Brigade.

BRIGADIER GENERAL C. H. PALLISER.

1st Punjab Cavalry.
2nd Punjab Cavalry.
3rd Sind Horse.

Artillery.

LIEUTENANT COLONEL C. B. LEMESURIER.

E. Battery 4th Brigade. 3rd Punjab Mountain Battery.
2nd Bombay Mountain Battery.

Engineers.

LIEUTENANT COLONEL W. HICHENS.

5th Company Bengal Sappers and Miners.
Engineers' Field Park.

Reserve Division (Poona.)

MAJOR GENERAL J. M. PRIMROSE.

Infantry.

67th Infantry (Madras) 30th Madras Native Infantry.
83rd Infantry (Bombay.) 36th Madras Native Infantry.
19th Bombay Native Infantry.
27th Bombay Native Infantry (1st Biluchis.)

Cavalry.

14th Hussars. 1st (Madras) Light Cavalry.
1st Sind Horse.

The foregoing "Ordre de Bataille" shows three movable columns which were to advance by the Khaiber and Kuram Passes towards Kabul, as well as by the Kojuck Pass towards Kandahar. A glance at the map proves that owing to the great intervals between them, each of these three columns must endeavour entirely by itself to accomplish the problems assigned to it, that in this case there could be no question "of marching separately to strike together."

In all the columns Artillery and Cavalry preponderated as compared with Infantry. Additional artillery was also brought from England as having regard to the season of the year which was approaching, when hostilities commenced, it was necessary that that arm should be in a position, in case of a blockade, to render effective resistance to the Afghans. The cavalry moreover had a sphere of action against the swarms of defectively armed Affghan horsemen marked out, without mentioning that the level stretches lying between the isolated defiles offer a magnificent battlefield and forgings, absolutely necessary, would have to be carried out by this arm. The composition of the brigades has been so arranged that the ratio of the European to the Native troops is that of one to two. The Bolan Column was originally the strongest almost three times as strong as the Kuram Column. This proportion has however been lately very much altered since General Biddulph with a portion of the Bolan Column returned to Quetta. The centre of gravity is now situated in the Khaiber Column with which the Kuram Column can always still eventually effect a junction, and which in any case, in the event of an offensive movement against Kabul, will be separated from the latter to an important extent.

The Kuram Column is too weak for independent action against Kabul and as already explained in the beginning has been appointed to a line little suited to that course. Whilst moreover in the former expedition the army advanced to Kabul by Quetta, Kandahar, and Ghuzni, and then used the Khaiber Pass only as a line of supply, now an inverted procedure has been resolved upon. This too corresponds with circumstances which have have meanwhile entirely altered. Forty years ago there was no Indus Valley line, Peshawur did not belong to the English, the Khaiber Pass was almost an unknown quantity, the campaign had not for its object the rectification of the frontier. The railroad now conveys reinforcements and supplies for the army from the whole of India to Rawal Pindi, thus up to close upon the North West Frontier, and to the alarm posts at Peshawur and Jumrood. Now the Khaiber Pass is sufficiently known, and it is known, that the line of supply by that route can be rendered secure by four hundred infantry, twelve guns and three hundred cavalry and how this can be done, as well as that the decision of the war lies in the occupation of Kabul.

Only the taking possession of the capital of the enemy will furnish proof to Asiatics of the immutable superiority and the pronounced

supremacy of the victor and vindicate to the Afghans the somewhat inconvenient conditions of peace. On the other side is bankrupt Persia,* without a fleet, without roads by land, without an army fit to take the field, absolutely not in a position to interfere in any way in the war, whether by operations against Herat or in its conclusion by a treaty of peace. In addition to this the East India squadron consisting of ten ships of war with seventy two guns is in a position to exercise strong pressure upon Persia. The Russians have however made the situation perfectly clear, by the recall of their ambassador Rosganow, accredited to Shere Ali, who arrived back again at Tashkend on the 20th February 1879, by the countermarch of the movable columns of Generals Kaufmaun and Lomakin to Samarcand and Krasnovodsk, and by the definite conclusion of peace with Turkey. The solemn assurance of Russia to respect the agreement, existing since the year 1872 between Russia and England, according to which Russia promised to refrain from any interference in the affairs of Afghanistan, has afforded the most conclusive proof, that it has for the present resigned Afghanistan to its fate. Consequently the Bolan Column in this campaign has neither to advance to Kabul, nor to secure Herat against Persia, or Russia, but has only and solely the task of maintaining the points, and districts, which on the conclusion of peace, are to remain in direct connexion with British India as a scientific frontier.

In the first place, the weakening of the Bolan column by four infantry regiments, and one battery, and in the next, the selection of a new road by the Tal Chotiali Pass, which General Biddulph used on his march back from Kandahar, correspond only with the intention of firmly establishing numerous communications with this important point, which consequently will apparently be a part of the scientific frontier in the permanent possession of the English. With regard to the "Ordre de bataille" it must be further remarked that a strong staff has been appointed to the commanders of single columns, which almost equals the staff laid down for a mobilised German corps d'armée. The difficulties of movement and of supply conditional upon the nature of the country, may perhaps render necessary this expenditure of strength.

On the other hand the rapid progress occasioned by the presence of the Commander in Chief, Sir Frederick Haines, appears of little benefit to the operations of a single column. Although at the beginning of the campaign the Commander-in-Chief seemed to wish to specially lead the Khaiber column, after a few days he repaired again to Calcutta. He has not since moved again beyond Lahore in that direction. General Browne Commanding the Division was, however, obliged in consequence of this, to arrange by written communications, first to the Commander in Chief at Calcutta, or rather at Lahore, all matters affecting the Reserve

* The standing Army of Persia is at present 5 batteries, 18,000 infantry 500 men of the regular cavalry, 10,000 irregular cavalry men, on the whole at most 30,000 men. Twelve Austrian officers are, since the 5th January, in Teheran for the purpose of organising a strong Infantry Corps of 2,600 men of 7 battalions of 800 men each.—

Division under General Maude, which is behind and even mixed up with his own troops. In like manner he is unable to place himself in direct communication with General Roberts.

The situation becomes still more complicated from this, that in consequence of the institution of "Political officers," the responsibility is divided between the military authority of the General in command, and the diplomatic military agents, referred to, who perform civil functions. Under these circumstances there can be no cessation to friction and loss of time.

Each of the columns has one such military diplomat. The best known is Major Cavagnari of the Khaiber column, who at Ali Musjid on the 21st September 1878 was sent back, and at present is endeavouring to commence negotiations with Yakub Khan. With the Kuram column is Captain Tucker, and with the Bolan column is Major Sandeman. The latter has now in Biluchistan firmly reestablished the old Brahui form of Government so that each of the small Khans there acknowledges the Khan of Khelat as Suzerain, but in his administration is independent, and occupies in the general confederation a definite position of authority.

The detachments of troops distributed to the three columns belong almost without exception to those in garrison in the north of British India. On the other hand the composition of the mobilised brigades is arranged with reference to this, and the regiments in them linked to one another arbitrarily. Frequently also during this campaign, have alterations taken place in them, so that it is not possible to know whether the above "*Ordre de bataille*," which corresponds with the beginning of the operations, is at this moment still correct in all respects. There has been apparently much alteration recently as to the holders of the higher appointments of the commands.

Thus, according to the latest news, in the Khaiber column General Maude is to obtain command of the 1st Division, when he has handed over the 2nd Division to General Bright, while General Samuel Browne has both these Divisions under his orders as General in chief command.

This arrangement of appointments may be a step in the right direction, but the Kuram and Khaiber columns must still as heretofore come to an understanding with each other through the Commander in Chief, who is generally engaged elsewhere.

There is very little clearness regarding these particulars, because the English authorities have not once admitted their own countrymen as correspondents during the war, although without ceremony, English war correspondents have inundated in the first line for the last thirty years the rest of the world, wherever there was war, and thus had at their disposal information of pre-eminent value.

Official reports have on the other hand very sparingly appeared, because hitherto the collisions in Afghanistan have chiefly been quite inconsiderable. On the other hand, a new means of telegraphing by the heliograph has been employed—one per Division—and has done good service. Thus General Stewart has sent by heliograph intelligence from the Khojuk Pass to Girishk, General Roberts from Khost to Bannu, and General Browne after the capture of Ali Musjid to Peshawar.

England has placed in the field against Afghanistan a total of about 34,000 combatants with one hundred and sixty guns and 8,000 cavalry horses, while her fighting strength in India consists of 6,000 European officers 60,000 non-commissioned officers rank and file and 120,000 native troops of all ranks, from the captain downwards inclusive.

These 186,000 men are made up of 146,000 infantry, 23,000 cavalry men, 13,000 artillery men, and 3,600 pioneers. There is thus not the fifth part of her army in the field, from which it is quite evident, that the mother country could within four weeks send reinforcements, and the Princes of India have already frequently offered their troops. There can therefore occur no deficiency for any subsequent contingency, specially as the net work of railways throughout India and communication by steamers come in to help. But on the other hand the troops of the Native Princes estimated on the whole at over 300,000 men are described, with reference to their armament and complete training, as standing on the very lowest step, and a modern shooting weapon must therefore be provided to them by the British Government for their use, which course certainly appears to require some thought.

Hitherto therefore England has made a very homœopathic use of the numerous offers of troops from the Princes of India. None of the contingents which have been accepted exceed in numbers one thousand men, and amongst the Princes to whom they belong, there is not one of those who rule over the larger States. Recently also English voices have frequently expressed their declaration of opinion, that after a scientific frontier has been obtained, the Indian Empire will be so secure that it will resemble an island, and that consequently their own troops as well as those of the Native Princes may be reduced so as to lower the charges in the budget.

It is apparent beforehand, that on this occasion the native Princes are about to make a beginning of taking down their own scaffolding, and it is not far to see, that this arrangement will be arrived at not from a tender consideration alone for the affairs of the Princes. England rules directly 190 millions of the inhabitants of India and only keeps in India 186,000 soldiers, while the one hundred and fifty three Native Princes, who count together only 50 millions of subjects, provide 300,000 fighting men. This proportion which has hitherto existed shows unmistakably the remarkable result of one to six.

But with regard to any subsequent reinforcements from the mother country, they can be employed only to relieve the troops, who are stationed in garrisons adapted for their acclimatisation, until the reinforcements themselves have become acclimatised to India. The loss most sensibly felt, namely that amongst the European officers, cannot however be so immediately repaired in the native regiments, because the native of India only follows unconditionally and with devotion the European officer, who has been known to him for a long time, who understands his language, and who shows the consideration, which is due to them, for his religious prejudices.

The Achilles heel of the Indian Army consists in this, that the infantry and cavalry regiments possess only seven European officers, in whose hands solely and alone rests the leading on the field of battle, whilst to the thirteen Native officers is entrusted the interior economy. How easily then can a regiment of the Indian Army be rendered almost incapable of fighting, which in the commencement of a campaign fights with distinction, and by these battles as well as through sickness, is deprived of its officers! So it happened at the action of Ali Musjid on the 21st November 1878 that thus on the day before the occupation of this fort six British officers of a battalion were placed "hors de combat," so that on the first day after crossing the frontier, one European officer only remained to lead and manage this battalion. To throw further light on the relative proportions of the Indian Army would lead now too far, and appears superfluous, as this subject has been formerly treated of in this publication.

Only with regard to the train it may here be mentioned that the scanty budget of the Indian Army in the time of peace provides exclusively for the transport train of twenty eight battalions, twenty squadrons, and seventy two guns; consequently for this Afghan expedition the disposable cadres were too small. For the transport service of each British battalion five hundred camels are required, for that of a native cavalry or infantry regiment four hundred camels, and for each battery three hundred and fifty camels. Each stage from the stations of the Indus Valley line, (Rawal-Pindi for the Kuram and Khaiber columns, and Shikarpur for the Bolan column), must be provided with one hundred camels, which thus for the sake of example amounts to 2,100 camels for the twelve days march from Sukkur to Dadur, and for the nine day's march from Dadur to Quetta only, without mentioning the six hundred mules and four hundred oxen disposed of on the Sukkur-Quetta line.

If now the other lines are considered namely Quetta- Kandahar, Rawal Pindi—Jellalabad, Rawal Pindi—Kuram, which must be provided for in a similar manner, the result is then a standard of the difficulties with which the commissariat have to contend. Then the number of 100,000 camels appears not to be excessive, and the complaint quite

credible, that the subsequent supply of these animals was not sufficient to fill up the gaps which occurred.

The extreme changes in the weather, want of water, and forage as well as unwholesome fodder, caused heavy losses amongst the camels, and the desertion of the drivers increased the difficulties. The oxen which had been collected for the transport service wore out their hoofs on hilly, stony ground to such a degree, that for months they were unfit for work, and the mules were not at any time sufficient in number for the transport of the ammunition of the troops.

Finally all these animals could be drawn only from certain localities, because those coming from warm districts in the plains proved immediately to be unsuitable. The 11th Battery of the 5th Brigade of Artillery remained stuck fast one and a half miles South of Quetta, because it had lost through sickness, two elephants, and twenty oxen, and the remainder of its three hundred oxen were so deteriorated through fatigue that they required more than a week's rest, which was indispensable. Transport train hardships, and the sickness resulting from them have certainly been the cause of the Bolan column withdrawing to Kandahar, the divisions pushed forward to Khelat-i-Ghilzai and Girishik, because on the one hand their military position was not at all threatened, and on the other hand this retrograde movement on the part of the English must have been resolved on, only in truth, with a heavy heart, because the Asiatic is too prone to draw conclusions most favorable to his own affairs and the most exaggerated, from any movement of the army which is not a forward one. In any case the English should make every effort to lighten the work of the commissariat by the construction of roads, and by the extension of the railway system from Pindi to Peshawar, or rather from Sukkur to Dadur. Also in the Kuram Valley a new military road to the Kuram Fort should be constructed with the utmost despatch. The season which is the worst for supplies is certainly soon got over, and the rain has fallen plentifully every where, so that a good harvest may be expected. Perhaps the fact may be interesting that the German "Erbsworst" has found its way to Afghanistan even, in order to put strength into the British Army and so indirectly to bring defeat to the Afghans.

SECTION III.

As regards the fighting strength of Afghanistan there is unfortunately little to be told, as on this subject the statements which are available do not at all agree. Major Lumsden, who has already been mentioned above, and who lived in the year 1857 at the Court of Dost Mahomed as British Resident, has stated that the regular army of the Amir at that time consisted of sixteen regiments of Infantry, three of cavalry and seventy six field guns. The infantry regiments were each about eight hundred men strong. The men were obtained from all the districts of the country by a compulsory levy. Their uniform consisted chiefly of cast off English clothes which were purchased at auctions in Peshawar. Each soldier received as pay five rupees (ten marks) per mensem but not regularly and then frequently in kind. Two months pay was deducted for clothing. Thus these half starved warriors were forced to have recourse to highway robbery. The Cavalry regiments were bad. In summer their horses were sent to graze. So also were the Artillery badly horsed. The officers with all three arms understood little of their profession, which corresponded with the state of the nation's civilisation. A Russian report of the year 1868 estimates the regular infantry at 10,000 men. According to it, no alteration had been made in these numbers from 1857 to 1868. The arming of the troops has at any rate now improved, as the English presented Shere Ali with 10,000 enfield rifles, 5,000 snider rifles, and one field battery. Enfield rifles were moreover captured in Ali Musjid on the 22nd November 1878. They are considerably inferior to the English Martini-Henry rifle.

Besides the regular army there are in addition the Jezailchis, light troops acting on foot, a part of whom, about 3,500, are paid five rupees per mensem by the State in cash, or in a corresponding quantity of cereals while the other portion of them, not being particular as to the share to which they are entitled, depend upon the Sirdars, and receive from them a portion of land rent free. They were much praised, specially for their hill fighting, but are not to be thought of in larger bodies, as tribal jealousy and blood feuds render such a combination impracticable.

Lumsden estimates the irregulars at 20,000 mounted men, and bestows the highest praise on them. Against these English authorities, the Russian accounts, which nominally originate with the General Staff of that country, place the army of the Amir, exclusive of the Irregulars, at 66,400 men with thirty guns, whilst the Amir himself has boasted, that he is possessed of an army of 80,000 men strong, inclusive of the Jezailchis. Its enormously wide distribution, owing to the badness of the roads, is also to be considered. The number whether higher or lower appears to be of less importance, than the intrinsic quality of the troops; and then it can scarcely be supposed, that the conditions have been in any way altered since Lumsden's report. From what source could the Amir have received money to pay his army sufficiently, especially if it had increased

in numbers? From what cause could the officers have become more efficient? Therefore at most the light troops and the irregular cavalry will perhaps be dangerous, not in the open battle field, but to the security of the lines of communication, and in case the English divisions should be obliged to fall back without making the necessary preparations beforehand. Nowhere in the country are there any fortresses which could offer any obstacle to the English, because all such enclosures have arisen as a protection against nomadic robbers, or at most as an obstruction to Asiatics, but are not equal to a regular siege. On the other hand the conclusion is not to be drawn from this that towns such as Jellalabad, Kandahar or Herat do not possess such a degree of natural strength, that in the hands of the British, they will not very soon be transformed even according to the European idea into strong "points d'appui." Major Pottinger has shewn this already in 1837 with reference to Herat. Kandahar offers the possibility of a considerable inundation by means of its numerous canals, and Jellalabad is now once more noted as of great strength, because, in 1841 it lodged in security the English, then besieged, although after the departure of the English it saw its fortifications again demolished.

How the advance of the three English columns has taken shape is made apparent by the map subjoined. General Browne (now Maude) is with his Division at Gundamuk, and Jellalabad; behind is the Reserve Division, commanded by Maude (now Bright) guarding the lines of communication to Jumrood. General Robert's force is at the Kuram Fort, behind him Watson at Kohat, with the troops of the Princes upon the line of communication, while General Stewart is concentrated at Kandahar, and General Biddulph has returned by way of Quetta, and has already reported very favorably of the Tal-Ch otiali route

Every thing is ready for the resumption of operations. In Jellalabad supplies for nine months are to be stored. On the other hand the probable advance must still be deferred, as it must first be definitely settled, whether Yakub Khan is in a position to enter into negotiations for peace, or rather whether he is altogether inclined to do so. This loss of time is however no disadvantage as the severity of this year's winter has heaped up such masses of snow in the mountains of Afghanistan that about fourteen days must still elapse before the Passes are free from snow, though already now (at the end of March) the troops in Jellalabad complain of the great heat.

The operations which have hitherto taken place offer little that is interesting and are perhaps still in every one's recollection, specially as this publication has only quite lately communicated the intelligence which was most valuable.

The day before the capture of Ali Musjid must alone be fully treated of separately, and specially, because it furnishes details rich in instruction. On this 21st November of the year that is past, the English

Artillery at the commencement alone took part in the fight, while the 3rd and 4th Infantry Brigades remained stationed to the rear of it, far removed from the lines of the enemy. When about 2 o'clock in the afternoon the infantry began its further advance, the artillery, whose ammunition wagons were still in rear, already suffered from a deficiency of ammunition and could not therefore effectively support the advance of the Infantry, when the batteries on the Afghan side, hitherto remaining masked, opened fire. The infantry, advancing without skirmishers began in consequence to fire much too soon, and the 51st Regiment amongst others had, about 4 o'clock, only three cartridges per man left. As this necessity for renewing the ammunition could no longer be appeased, the attack, owing to the advanced hour of the day, was consequently not carried out, and the 4th Infantry Brigade was moreover withdrawn out of reach of the enemy's fire, which made some casualties unavoidable. The turning Brigade under Macpherson had on it's part lost time for this reason, that a halt was necessarily made, until the mules, which had only just been told off to regiments, had come up with the ammunition. This turning movement demonstrated to the Afghan Commander that the frontier tribes swore allegiance to British gold, and that consequently it was high time for him to evacuate the Fort, if he wished to preserve for the Amir his six batteries. Only two and a half batteries escaped to Jellalabad, in consequence of the want of officers, as well as of the close pursuit of the English, and of the hostile attitude of the Afridis; the remainder were blown up and captured. Shere Ali had not during the past year distributed any money to the Afridis, now he reaped the fruits of his false economy. His four battalions and twenty four guns at the Peiwar were forced also to retreat in consequence of a turning movement by General Roberts on the 2nd December which retreat degenerated into a disorderly flight. Only one battalion and a half escaped. The two battalions stationed in Jellalabad evacuated that place without waiting for the enemy.

Despite of all this Shere Ali, who had already sent away his family on the 1st December, seems to have formed the intention of opposing the English at Kabul, if necessary, with fourteen battalions. The population of Kabul excited by the success of the English, by scarcity and sickness, and encouraged by the partisans of Yakub Khan and the anti-Russian party assumed now so threatening an attitude, that Shere Ali, on the 13th December 1878, with the Russian embassy left Kabul, in order to die a few weeks later, on the 21st February 1879, at Mazar-i-Scharif (east of Balkh), disappointed in his hopes. The sum total of the English losses up to the present, in the battle at Ali Musjid, at the Peiwar Pass in the Kuram Valley, as well as at Takt-i-Pul, and Khusk-i-Nakhud did not amount to 260 men, namely nine officers, and sixty two men killed, and nine officers, and one hundred and seventy eight men wounded. Much more considerable are the sacrifices made to climate and to hardships. Amongst the heaviest has been the condition of the sick in the Native regiments of the Bolan column. The total deductions due to fighting and sickness is in any case very trifling.

The cost of the war up to this is moreover not considerable. There is still money at disposal of the forty million marks which had been granted for the Afghan Expedition, half of it falling on the English and half on the Indian budget.

As great as has been the disappointment of Shere Ali, even so joyfully surprised may the English be at the success obtained, which is out of all proportion to their insignificant sacrifices in men and money. Notwithstanding the unfavorable season of the year, the six weeks after the commencement of the campaign secured the possession of all those objects, the lasting acquisition of which, appeared necessary for the improvement of the north west frontier of India, as it has hitherto existed.

This "scientific frontier" is made clear on the accompanying map, which will also bring the glaciis of what has hitherto been the defensive line into possession of the English, and by this means the debouché of this line will be secured in such a manner, that a struggle breaking out, at some time or other, between Russia and England will find its bloody decision in territory outside of British India. According to this Jellalabad, Dakka, the Kuram district with the Shu-targardan Pass, the Pishin Valley with Kandahar, which is the key of that place, should remain permanently in the occupation of the English. It is however possible, that they may give up again Jellalabad, Dakka and the Kuram District on account of the difficulty of governing the independent hill tribes dwelling there, and be satisfied thus with the exit from the Khaiber and Kuram Passes by the establishment of large entrenched camps to command these defiles; the route from Balkh by Kabul appears specially unsuited for large masses of troops, and the hill tribes, dwelling between Afghanistan and India, would probably always fight on the side of England against an army of invasion, in case of a Russian inroad in mighty horde-like masses. England will probably give up again, under no possible circumstances, the Pishin Valley and Kandahar, as well as the heights bordering the Khaiber Pass at Lundi Khana; indeed those voices are not silenced, which even now already talk of the occupation of Herat, that place described by the Persians, as a handful of Persian sand from Khorassan.

The caravan road from Persia runs by Meshed, the one from Bokhara by Merv into the valley of the Hari Rud to Herat. The former is eight hundred kilometres in length, the latter seven hundred and fifty two kilometres. From the Caspian sea to Merv is seven hundred kilometres, from Samarkand by Maimena to Herat is nine hundred and sixty kilometres. The line of route from Herat by Kandahar passing Ghuzni to Kabul is nine hundred and forty one kilometres. This is the caravan route, while the line of communication Herat-Kabul by Maimena, Balkh, Khoulim, Koundouz, would be very defective. From this it follows that Herat is the point of junction of the routes for the Persians coming by Meshed, and for those from Bokhara

by Merv, from Samarkand by Maimena as well as for the Russians coming there by the Caspian sea. But all these must, no matter whether their ultimate destination is Kabul or Quetta, first of all proceed to Kandahar. The latter is consequently the key to all the Passes on the frontier of Afghanistan leading into India. The advance against Herat, distant about five hundred and thirty kilometres, is always practicable to the occupier of Kandahar, owing to the good state of the road, and is also favored by this, that the junction of the routes of the Persians and Russians at Herat is very much more difficult.

The best route for the Russians to India is by the Caspian sea, along the Atrek and so to Merv. But from the sea to Merv there are always still eight hundred kilometres to be got over, and upon the Caspian sea there are at present only twenty schooners, which at most could perhaps transport, from Krasnovodsk to the mouth of the Atrek, one thousand Cossacks and six battalions. It will therefore be always possible for the English occupying Kandahar to anticipate there, an adversary marching on Herat.

To meet the demand for an offensive boundary, which will keep war outside of the country, it is sufficient that the English occupy Kandahar, and if possible establish a permanent agent in Herat, who will keep his eye upon the north and west. But Kandahar is moreover no disagreeable possession, as the neighbourhood is rich, and the climate agreeable. So long as it is occupied the enemy cannot move to Kabul, distant five hundred kilometres, nor to Peshawar via the Khaiber lying some three hundred kilometres still further off. So also the Khojak Pass is secured by the possession of Kandahar. The permanent acquisition of this place seems a necessity with regard to Herat, as well as to the whole of the Passes which lead to India by the route Kandahar-Kabul over the Suliman range. Quetta, which has hitherto been held in occupation, is doubtless strong, but it forms a covering only for the Bolan Pass, and the lower Indus Valley as well as for the routes leading to the sea. From Quetta to Dadur, is only seventeen German miles, from Dadur there are still to be constructed thirty miles of railway, in order to find a junction with the Indus Valley line, probably at Sukkur. The sixty miles of rail from Sukkur to Karachi are already at the present time journeyed over in twenty hours travelling time. Karachi should in future form the base for Kandahar, especially if it becomes a reality that the Euphrates Valley Railway has its terminus there. Even already at the present time it is well suited as a base. Its harbour is sufficiently deep for large vessels. The journey by sea from Bombay to that place takes two and half days. The voyage from Portsmouth by the Suez Canal and Aden lasts from thirty to thirty four days. War *matériel* also and reinforcements from England as well as from Bombay, would be directed to Karachi in order to reach Dadur by rail in a journey of thirty hours, or in case of necessity to be conveyed without difficulty by steamers on the Indus to Sukkur. Transport animals would be conveyed from India to Multan and Suk-

kur as far as the railway terminus at Dadur, while up to this they have been necessarily despatched from Multan by route march by Mithankot to Dadur. This important Kandahar is, as is apparent, easily reached from England in about six weeks, and from India in about fourteen days.

But how a hostile advance against India could be developed, when Kandahar would serve as a "point d'appui" for the enemy, may now be shortly considered. As the line Herat-Kabul-Kandahar encloses the most productive portion of Afghanistan, so the providing for the army would be much facilitated, the best routes of the country would be at its disposal, the whole western boundary of British India would be threatened, and on the line Karachi-Sukkur the utilisation of the Indus Valley railway, and of transport by steamers would be placed in jeopardy. A river affords no considerable defence, the Indus in especial is not adapted for it, because the left bank is flat, and commanded by the right. The Indus consequently requires a widely extended defence, because it is a means of general traffic, and possesses no strong railway bridges, rather two bridges of boats effect the railway connection, and because, which is the worst part of it, the whole railway line from Sukkur to Karachi runs on the right bank. The hostile army would be able to advance for about six hundred kilometres through the Khojuk Pass by Kelat to Gundava, and Sarkhana by a widely circuitous route, but a good one, and well supplied with water.

The great treeless plain from Mittri to Larkhana offers a very extensive place of concentration for a large army, and, when the trains of the army are there assembled, for moving them forward for the passage of the Indus, directed on a point in advance, which may be selected at will. This is a matter of importance on this account, because an invading army must bring with it the material for throwing a bridge across the Indus.

But what mischief might arise to the English in India, if the intelligence spread through that great Empire, that a hostile army had crossed the Indus. In consequence of the railway network spread over India, the interest of the population in public affairs has increased immensely.

The plan of the English for the railways in India and its execution is the greatest gain which England has acquired of herself for her 240 millions of subjects in that country. Formerly the western frontier could be reached from Calcutta by the river route alone. The systematic construction of roads and communications up to the year 1850 resulted in this, that six hundred and fifty german miles of solid roads, and three hundred and sixty miles of canals were opened for traffic. Not till 1853 was the first railway line opened. This delay was, however, abundantly compensated for, because all the experiences in Europe became available on this subject.

Above all India gained the one enormous advantage, that at the commencement of the construction of the lines the Governor General, the Marquis of Dalhousie, established a compact scheme of construction of lines of railway, which comprised the whole of India in an extent of about 2,000 German miles, therefore only with one tenth of the closeness of the railway network in Europe. This plan has been successfully accomplished in such a manner, that at the present time four fifths of the entire extent has been completely constructed. In the commencement two mistakes only were made, the one that the normal width of the guage was too great, being about one third greater than that of the german lines, the other that the construction was given over to private companies under a guarantee of interest by the state. Both occasioned the management to be uselessly costly. The unnecessary width of the guage added to the cost of construction in every respect, both for the laying out of the line, and for the goods wagons, and caused a daily expenditure, which was useless; while the rolling stock being much too extensive made a greater consumption of coal for the working of it unavoidable. But the construction by private companies, under a guarantee from the State of interest, led only to the construction of sections on speculation, and prevented the scheme being carried out in its entirety. The Government of England saw itself, in consequence, necessitated to take the matter into its own hands. Since 1870 the State alone has constructed the lines, and by diminishing the original width of the guage to that of a metre, by cheaper material for the road, and by less consumption of coal, as well as by economy in management, has obtained such favorable financial results, that the railway scheme will be carried out successfully, when even the variable currents of a river make the construction of bridges very costly. England provides the material, for example, the sleepers, the engines, the coals

The railways afford to the natives of the country the most palpable proof of the energy, the power, and the resources of the English, who are the rulers, as well as of the advantage which India derives from her connection with England. Where the steam carriage rolls there must famine give ground, there clothing and subsistence for the population must become cheaper, there the difficulties due to the climate must be diminished, because unhealthy stretches of the country are rapidly passed by. The chief advantage for the natives of India, however, consists principally in this, that prejudices will be removed, and customs be altered, which otherwise no power on earth could have surmounted. Those belonging to the Hindu castes, which exceed three hundred; and to the Bengal castes, which are one thousand in number, now journey in the same railway compartment without aversion. Yes even the pilgrims make use of the train. Even the Princes of India, of whose ceremonial it is a special feature to allow themselves to be expected for hours, make their appearance with punctuality at the railway station, when once they have had the gloomy experience, that the steam horse waits not a minute for their magnificence.

But the condition of the Government also has much improved, since the different provincial seats of Government have approached nearer to each other; the military force is utilised with facility, rapidity and greater precision, (for military purposes a special park of carriages is provided); and Europeans devote themselves more readily to duty in India, in the unhealthy hot season of the year, since the iron road leads in the shortest space of time to the beautiful and healthy summer freshness of the Himalayas.

The lines of railway in India proved their great military value by the expedition to Malta. Without them it would not have been possible with rapidity, or with maintaining the troops in a satisfactory state. Had the old existence of castes not already received a powerful blow through the railway traffic, the troops of the Malta Division could not have been rationed at all during a long sea voyage. How for example could all the different castes have cooked separately on board ship, without mentioning at all those, who in general would cook on land only?

For the latter the Euphrates Valley railway will in the future be a soother of their conscience, because the whole distance amounting to four hundred and thirty German miles from Karachi to Cyprus will require only one hundred and twenty miles of the journey to be performed by steamer, through the Persian Gulf from Kovait to Jasch; while from Tripolis by Bagdad to Kovait, distance one hundred and seventy German miles, and from Jasch to Karachi, a further distance of one hundred and forty German miles will be travelled over on a road by land, in carriages drawn by steam. This railway project is a magnificent one, offering few difficulties, since Lebanon will be crossed by the Wadi Khalid Pass. The journey from Karachi to Cyprus will then require only seven days, while communication by the Suez Canal requires twenty four days.

Then too the project of a railway through Asia Minor will be carried into effect, namely an extension of it from Bagdad by Mosul, Diarbekir, Angora, Scutari, so England's influence would be secured in Asia Minor, and as far as Constantinople. On the other hand the Russians are completing the existing line Poti—Tiflis to Baku on the Caspian sea, and Persia has a scheme for constructing a line from Enseli on the Caspian sea by Teheran,—Ispahan—Schiras to Bushire. Should the projected railway lines of Chiwa,—Balkh—Kabul,—Peshawar, or of Peshawar,—Kabul,—Herat,—Teheran,—Tiflis, ever be realised, then would there be established at that time and in that situation a very near chance of a war of railways between Russia and England in Asia Minor and India. At present it is unnecessary to explain the project clearly, although it appears to be indicated, as it will again constantly come to the surface in the newspapers, and on the other hand will furnish proof in how many ways known to the interested parties, the future will be carefully scanned.

Invasions of India have, however, been undertaken not alone from Persia, and Afghanistan, but in the beginning of this century a Chinese Tibetan Army penetrated by the Himalayas to Nepaul, and conquered the Goorkhas the most famous soldiers in the Anglo-Indian Army. For England however, the neighbourhood of China is no cause of disquietude, as the boundary is not a subject of dispute, and China considers herself injured by Russia. The latter annexed in 1868 the province of Kuladscha and incorporated that district with Kizil Yart, with Kar Kul Su, and with the source of the Kizil Su.

It is therefore quite probable, that China is waiting for a favorable opportunity only, to deal the Russians a decided blow in Central Asia, and consequently can never be England's enemy but rather her ally.

Finally there would only be the further question to dispose of as to how far India is endangered or secured by her seaboard? The answer is, that latterly, much has been done for the coast defences of her commercial harbours, but that even without this, not only are the coasts of India but all her commerce by sea with the mother country, even indeed commercial intercourse on all sides, guaranteed in such a manner by the supremacy of England on the sea, that no warlike constellation could occasion disturbances in this direction. The English fleet has in recent times grown up to a strength never yet reached, and thus its admirable net of marine stations has in the course of centuries been ever woven closer, and stronger. The Suez Canal, the islands of Socotra and Cyprus are the newest meshes of this net of maritime conquest.

During the mobilisation in spring, there were stationed in the Mediterranean thirty seven ships of war, with three hundred and nine guns, and 1,000 men. Seventeen of these ships, with one hundred and thirty four guns and 5,000 men formed at Constantinople, and Gallipoli a kind of Turkish reserve. Amongst these ships were sixteen large ironclads, while the German Empire possesses in all only twelve ships of a like description. In the West Indies and North America there were stationed thirteen ships, with one hundred and three guns and 2,400 men, while on the west coast of America, the so called Pacific station, there were ready for disposal nine ships, with eighty two guns and 1,800 men. The East India station was occupied by eleven ships, ninety six guns and 1,800 men. While the China station, inclusive of the English Siberian squadron at the mouth of the Amur counts twenty ships, one hundred and sixteen guns, and 2,000, men. There were also a smaller number of ships stationed on the south east coast of America, the west coast of Africa, at Australia, and the Fiji islands. So that, on the whole, one hundred and fourteen ships of war from the mother country watched over England's supremacy on the sea. About one hundred ships were on duty in British harbours, so that two ironclad squadrons of fourteen ironclads lay ready for immediate despatch, and despite this the coast defences are not overlooked. The whole fleet consists of sixty four ironclads, one

hundred and twenty five sailing vessels, and at least three hundred and sixty steamers, of which the half are on the active list, while the remainder could be ready for service in the shortest space of time. The *personnel* of the fleet is 46,000 seamen strong; the marine artillery numbers 2,800, and the marine infantry 11,000 men, and to this is added, in case of war, 19,500 marine reserve men. This total of 80,000 men is able, not only to fully man the ships of the Navy, but also such ships of the mercantile marine, of 25,000 vessels strong, as the Government determine to buy or to hire.

These numbers require no commentary, especially as a cursory examination of the accompanying sketch map, (a circle marks the stations while a line joining the circles gives in German miles their distance from one another), shows, that the British Empire encircles the ocean with a chain of posts worthy of wonder, which have been constructed in the course of centuries. Great Britain by this means possesses an absolute monopoly of every requisite. But, in case of war, these stations are of paramount importance to all nations, so long indeed as the commerce of England appears safe, and can undertake the business which up to that time the mercantile marine of other nations executed; but which in times of a general war by land and sea they no longer venture to undertake. Moreover England's maritime superiority is, in addition, increased by the coals from Wales, which have not their equal in quality, by its supply of iron, by its spirit of invention and by its industry. The supremacy of England on the sea has blossomed since, and by the introduction of steam vessels, and the English have immediately perceived how, now for the first time, to utilise the stations of the fleet, and that these should likewise be increased, as has been done during the most recent times, so as to be more secure of the advantages from them.

So long as the speed of ships depends upon the heat generated by coals, England will continue without a rival upon the sea. While all other nations, in case of war, must eagerly take in their coal supply in neutral ports, and in small quantities, while all other navies, even now in the time of peace, must sail much, and economise their steam, while on this account a considerable restriction of the vessel's speed with a more clumsy construction of their ships is unavoidable, England can entirely dispense with sails upon her steamers, and must calculate their supply of coals with reference to this, that the coals of her different colonies are not equal in quality, and that on the other hand the greatest distance of her stations from each other is seven hundred german miles.

On the line, which is of importance to India, from England to Hong Kong, the most continuous stretch of this section namely Aden-Point de Galle is only four hundred miles in length. On this account a quite different construction of the ship is practicable, with a speed in the vessel which has never been surpassed, together with superior power of directing its movements. The whole of the mighty ironclads

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UNITED SERVICE INSTITUTION OF INDIA.

NOTICE is here given that the subject of the Essay for the Institution Gold Medal, for this year, is "A Transport Service for Asiatic Warfare."

The terms of competition are :—

1. The Candidates must be Government Gazetted Officers.
2. The Essays must be legibly written, or printed, not exceeding 32 Pages of the Size and Style of the Journal.
3. The Essays must be forwarded to the Secretary on or before the 1st May 1880.
4. The Essays must be strictly anonymous, but each to have a motto, and be accompanied by a sealed envelope with the motto written on the outside and the name of the Candidate inside.
5. The Essays will be submitted for decision to three Referees chosen by the Council.
6. The successful Candidate will be presented with the medal at the Annual Meeting (if he be present), and his Essay will be printed in the Journal.

By order of Council,

A. D. ANDERSON, CAPT. R. A.,

Secretary, United Service Institution of India.

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Secretary, United Service Institution of India.

SIMLA. }
20th Oct., 1879. }

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A. D. ANDERSON, CAPT., R.A.,
Secretary, United Service Institution of India.

ORIGINAL PAPERS.

I.

SUGGESTIONS FOR THE FORMATION OF "PIONEER AND SAPPER" COMPANIES IN REGIMENTS OF NATIVE INFANTRY,

BY MAJOR H. FANE H. SEWELL, M. S. C.

PREFACE.

Although in the following paper I have only proposed, on the principle that half a loaf is better than no bread, the formation of a company of Pioneers in each of our Regiments of Native Infantry I cannot lose this opportunity of urging for consideration whether it would not be far wiser that all our Regiments of Native Infantry, should be Regiments of Pioneers?

I am very strongly of opinion, and have been for many years, that they certainly should, and with this sole object, namely in order that during times of Peace they should be employed in works of Public and Imperial utility, instead of as now, sitting doing nothing. Look back upon the past and consider of what use have these thousands of Natives been to the Government? Absolutely of *no use at all that they could not have just as well been* had they been serviceably employed all the time instead of being kept up at great cost to the State and allowed to idle away their time more or less in garrison, where their presence was often only a fancied necessity. What, let me ask, was there to prevent this multitude of strong able-bodied men being so employed, as to enable them to make some return to Government for the enormous outlay necessary in keeping them together? Absolutely nothing. No good sound reason.

Drill?—There is far too much of it *for the drilled soldier*, there would be ample time for both all the drill that is *necessary, and* useful work. Musketry?—It need not be interfered with in the least. Discipline?—It would be strengthened rather than suffer. Caste prejudices?—Untenable, the man who objects to honest useful labor is no soldier. I merely point to our "Sappers and Miners." Are

they worse drilled, worse shots, less disciplined, worse soldiers than the rest of our Native Troops? I fear no contradiction when I assert, certainly not.

The advantages which I have tried (I feel, only too inadequately) to show in this paper, must result to a company instructed as Pioneers, will equally do so to the whole force of Native Infantry if so educated, and now that the Re-organization of the Native Army is being seriously contemplated by Government I cannot help feeling that it would be no slight matter for it to take into its consideration, and one well worthy of it, whether it would not be preferable that the Native Infantry should be so organized that during peace it can be employed usefully towards the State and occupied advantageously to itself, rather than that, as for many years past, it should continue to remain, when not on active service an almost utterly un-reproductive possession of the Imperial Crown of India.

It will, I think, be readily admitted that the efficiency of every Regiment of Native Infantry would be considerably increased by having one of its companies thoroughly instructed as Pioneers and Sappers, and a very little trouble would, I consider, obtain for each corps in the service this desideratum.

I will commence by assuming, and I do not think I assume too much, that there will be found with every Regiment of Native Infantry, at least one European Officer who has passed some sort of Examination proving his competency, or has otherwise qualified himself to instruct men in the ordinary duties required of Pioneers and Sappers.

Such an Officer should receive a Staff allowance of, say, Rs 75 to 100 per mensem an inducement for other Officers to qualify for this post, and the enhanced value of a corps with a well instructed Pioneer company would soon, as I hope presently to show, repay Government for this slight outlay.

To proceed. Such an Officer being available, I would suggest that in the first instance, the Native Commissioned and Non-Commissioned Officers of the Regiment should undergo an elementary Course of Instruction (the particulars of which will be given hereafter) under the Officer Instructor, they should be taken off all duty by Wings at a time until the completion of the course.

From this body of Native Commissioned and Non-Commissioned Officers, thus partially instructed in the work of Pioneers and Sappers, could be formed a *Staff of Instructors* of those who have shown most intelligence in, and aptitude for, the execution of the tasks required of them whilst under instruction.

This Staff of Instructors should consist of 1. Subadar 1. Jemadar 5. Havildars 5. Naiks.

With this Staff to assist him the Officer Instructor could proceed to the Preliminary Instruction of the whole Regiment, by complete companies at a time, taken off duty and handed over entirely to the Officer Instructor during the course.

Here it may be as well to mention that although there would be no use in selecting men of 12 years service and upwards for the Pioneer company, seeing that by the time they had attained any great proficiency in their duties as Pioneers or Sappers they would be on the verge of becoming entitled to pension, still, since even the little knowledge they would obtain by going through the Elementary Course would much add to the general efficiency of the Regiment (more especially if, as I would suggest, the Course, for the purpose of keeping up such knowledge, be an annual one) no man of the Regiment, whatever his service, ought to be excused from going through this Elementary Course, unless some cogent reason for his being so, exists.

The value on service of a Regiment, and the great advantages to itself it would possess, by having become even partially familiar with some of the duties now performed in our Army almost exclusively by that very distinguished and intelligently useful corps, the Sappers and Miners, are far too evident to require any special demonstration here.

Again from each company about 12 of the best men, those, that is, who give the fairest promise of becoming clever and diligent work men, should be selected and set apart.

When the whole Regiment has thus gone through this Elementary and trial course, the Officer Instructor should *again* select from those who have been set apart as the best men the required number of files to form a full company, which should be styled the "Pioneer company" its Native Commissioned and Non-Commissioned officers being of course those already selected as the Staff of Instructors.

For the Elementary and trial course, I would propose that some such work as the following be required.

1. The tracing and construction of the simplest description of Field Defences in addition to the shelter trench, and gun and charger pits.
- 2.—The construction of a few yards of parapet and ditch of an ordinary Redoubt previously traced, and for which the profiles have been set up under the superintendence of the Officer Instructor, the duties of diggers, shovellers and rammers being gone through by regular reliefs.

- 3.—The cutting and preparing of brushwood for use in revetments &c., the object of this work being explained and illustrated by the construction of one or two gabions and fascines.
- 4.—A knowledge of the several simpler descriptions of knots and lashings required in the construction of military Bridges.
- 5.—The piercing of loopholes in walls and constructing them with sandbags on parapets.
- 6.—Construction of a sandbag revetment.
- 7.—The proper use of the axe, bill-hook or "koolharie," spade, "mamootie," pick, and crowbar.

This could all be learnt by each class in a week, working two hours in the morning and two in the evening, at the least, which should bring this preliminary course of a whole corps to a termination in 3 months at the outside.

It must be borne in mind that the object of this preliminary course in the first instance, is *simply* and *solely* to enable the Officer Instructor, from a personal knowledge of the capabilities of every single man in the Regiment for the duties of a Sapper and the likelihood of his becoming a good one, to select those men out of the 8 companies who represent the most promising material that the Regiment contains for the formation of its "Pioneer Company."

By some such method as the above, then, the required company may, with little difficulty I trust I have shown, be called into existence.

Now, having formed the Pioneer Sapper Company, it remains to be considered.

1st How this raw material is to be worked up into a thoroughly serviceable article.

2nd How it is to be *maintained* in a high state of efficiency.

The key to the solution of these problems is, I am of opinion, in the fact that *it must be made worth the men's while* to lay themselves out for the fulfilment of these two desired objects. It must therefore be determined how this can best be done, before proceeding to solve the problems themselves.

I would suggest then that the best way to make it worth the men's while to become efficient and to continue so, would be to attach to the Pioneer Sapper Company *when reported efficient*, certain privileges and distinctions not enjoyed by the other Companies of the Regiments, so that removal from the company (at the will of the Commanding Officer)

would be not only a disgrace but also a pecuniary and appreciable loss to the man removed for inefficiency.

These privileges and distinctions might be somewhat as follows.

- a.*—The Pioneer Company should always hold the post of honor on the right of the line.
- b.*—It should always lead the Regiment on the march.
- c.*—It should be excused all Garrison Guard and orderly duties and when “on the March” Regimental Guards also, except on emergencies.
- d.*—Should not be either in part or as a whole required to furnish Detachments.
- e.*—Should not be required to attend more than one Regimental or Brigade Parade during the week, when in garrison, if then employed on any public work.
- f.*—Should be permitted to wear some distinguishing badge on the right fore-arm say a Maltese cross in blue, or cross axes.
- g.*—This badge, to carry with it an allowance of 6 pies for the private 9 pies for the Naik and 1 anna for the Non-Commissioned, officers *per diem*, should be attached. The privates should be divided into 1st, 2nd and 3rd class Pioneers distinguishable by bars on the arm below the Company badge. 1st class men (2 bars) of whom there should be 10 in the company, the five senior being Lance Naiks, to be as a rule exempt from all the heavier work and the next five eligible for the Lance stripes. All to have one rupee a month extra pay and 2nd class men (1 bar) also 10 in number, with 8 annas a month extra pay. 3rd class men must rise through the latter class before they can be promoted to the Lance Grade. Intelligence, skill, diligence and good character should be the qualifications for the superior classes.
- h.*—The Native Officers in addition to an allowance of say 8 Rs. to the Subadar and 5 Rs. to the Jemadar per mensem, should have brevet rank. The Subadar ranking next the Subadar Major and the Jemadar next to the senior Jemadar, neither of whom should be eligible for the Pioneer Company.

Some such privileges as the above would, I think, be sufficient to make the rank of “Pioneer” looked upon by the men of the Regiment as a prize to be sought after, and thus assist the Regimental Authorities very materially in the accomplishment of the two objects, viz., thorough education and maintained efficiency, so essential to the permanent usefulness of this Company.

These two objects might thus be obtained.

1st—HOW THE RAW MATERIAL IS TO BE WORKED UP INTO A SERVICE-ABLE ARTICLE IS THE EDUCATION OF THE COMPANY FOR PIONEER AND SAPPER DUTIES.

The Officers and men having already been slightly taught should now be regularly taken in hand by the Officer Instructor, and, commencing *ab initio* be required thoroughly to master the objects mentioned above, as those of the Preliminary Course and should be instructed and worked up in all the details of Field Fortification, as laid down in the various sections of Part I. of the Manual of Field Fortification. Road making should also constitute a principal branch of the company's instruction, and moreover some of the men should be able to do well rough stone mason's, bricklayer's, ironsmith's and carpenter's work, (all of them should have a general knowledge of these various branches of industry) and with this end in view, men of these trades should be considered eligible for the Pioneer Company if otherwise so, as to age and character.

All tools and materials should be furnished freely by Government, the Officer Instructor under the Officer Commanding the Regiment being responsible for their care, preservation and legitimate expenditure.

And finally, the Company should be taught scouting and visual signalling as essential to it's character as the Pioneer and Scientific Company of the Regiment.

Weather permitting every man of the Company should be out daily, morning and evening under the Instructor learning his work just as Sapper Recruits are. Those who have not fulfilled the expectations entertained of them as to their probable fitness for pioneer duties should unhesitatingly be rejected and other men of promise taken from the Regiment to replace them.

At such times as the company is unable to work out of doors it could be employed on indoor work. Such as fascine or gabion making, knot tying, splicing, signalling and other like occupations, or the men might be split up into classes and one class catechised by the Instructor on work already done in the Field, whilst the other classes occupied themselves as above, or else listened to the questions put to, and answers of, the men under examination. The Barrack verandahs or other convenient places would be available for such instruction. The great object to be kept in view being, that when once the course has commenced *nothing* should be permitted to interfere with the regular daily work of the men, until the company is pronounced by the Instructor to be thoroughly efficient as a Pioneer and Sapper Company, it's efficiency *practically* tested by the Officer Commanding the Regiment, satisfactorily proved before

him, and duly reported to Head Quarters and *not until then* should any of the allowances be passed to those with the company at its final examination, nor should the badges, bars, and lance stripes (awarded by the Officer Instructor) be permitted to be worn nor the other privileges of the company come into operation.

2ND—HOW THE COMPANY IS TO BE MAINTAINED IN A HIGH STATE OF EFFICIENCY.

This may at first sight appear difficult in time of peace, but I think I can prove that it in reality will not be so.

To accomplish it, the Pioneers must be in the first place kept constantly employed.

2ndly the highest state of discipline must be rigidly enforced seeing that these men may be called upon at any time to work individually and are liable at times to be isolated from all supervision. A high *sense* of discipline and duty must therefore be inculcated strongly upon the men.

3rdly inefficients from whatever cause, ill health, superannuation, loss of character, (twice a Regimental Defaulter implies removal from the company) and others causes, must not be retained on the strength of the Company an hour after incompetency is satisfactorily determined.

4thly careful provision must be made for the proper recruiting of the company (from the rest of the Regiment), which should always be kept up to its full strength, qualified men in all ranks being always held in readiness to fill up vacancies directly they occur.

In answer to the question which perhaps may be put:—How do I propose that the men are to be kept constantly employed? I would suggest that they should, when not engaged on musketry duties, be employed in repairing and keeping in order cantonment roads, sinking or repairing wells, repairing and improving their lines, Barracks, and Government buildings and be utilized on Public Works, in numberless other ways, with the object of saving Government many a small item, and indeed often a large one, which otherwise helps to swell so considerably the annual Imperial Budget for such works. All suitable petty repairs could be effected by these men for Government, in cantonments, and when not so employed they could be occupied in keeping the main communications towards other stations in repair or be constructing fresh ones if required.

With one of these companies in each of our Native Regiments of the Line it is almost needless to point out the immense saving to Government which would annually be effected by their industry, with the satisfaction of knowing too (*i. e.* if the companies are kept up to the

state of efficiency I am satisfied, with proper care, they easily could be), that the work carried out by them would be both thorough and to be depended upon, seeing that it would be no gain to the men to do scamp work.

Such would be their utility during the piping times of Peace, and of their increased usefulness in War I need only point to the example of the Pioneer companies of the German Army, in their Austrian and French Campaigns, and there too will be seen whether men trained, as I have suggested, are likely to be any the worse soldiers for being able to handle the pick and shovel as readily and well as their rifles. Nay, I dare venture to predict that were Pioneer companies formed and utilized as I have endeavoured to show they may be in every Regiment of our Native Infantry, every Commanding Officer would soon readily admit his Pioneer company to be the finest, smartest, and best behaved company in his Regiment, and the reason why this would be so, must be so, is not difficult to understand. Simply because the men composing it are kept usefully employed, are made to a great extent self reliant, their intelligence is kept bright, not allowed to be rusting away in idleness and debauchery, and their sense of self respect necessarily heightened. They cannot help becoming good soldiers both in peace and in war. And, further, can any one with a knowledge of the force of example, doubt the advantage such a company would have upon the rest of the Regiment? Or can any one doubt the advantages the "Pioneer" company would have by it's training over it's fellows should the strain of a campaign fall upon it?

It may be urged that taking a hundred men of a corps away from guard and sentry duty in this manner will make that duty fall very heavily on the rest of their comrades. *But this need not do so if guard duties are properly economised.* From long and careful thought over this point and observation, extending over many long years of Regimental service, I am satisfied that our stations are during peace *very much over guarded*, a most hurtful system for many reasons. Guards might be safely and with great advantage reduced by at the very least one fifth or one sixth of their present strength thus freeing the men from the most tedious and irksome of their duties, that of mounting sentry where such is quite unnecessary.

As to by whom, or at whose orders, the Pioneer company, or parts of it are to be employed during peace in works of Imperial utility would be foreign to my purpose to suggest. The task I set myself to try and work out, was to offer for the consideration of the Powers that be ideas which have occurred to me, as they probably may have to many others, at various times, indicating roughly how, what appears to me, an uncut gem which Government now holds in it's grasp, may, with little difficulty be so cut and polished as to render it a comparatively invaluable possession, and in offering these ideas, so to place them before the authorities that the subject of this paper may have been held up in

such a light as to draw their attention to it's value and appeal to them as to whether it is not worthy of that consideration which in my humble opinion it seems undoubtedly to deserve.

I fear I may have but ill accomplished my task, and I put my "ideas" forward with no little diffidence. If they bear any fruit, well, if not, at least they can do no harm.

H. FANE H. SEWELL, Major. M. S. C.,

Hyderabad Contingent.

II.

A SCHEME FOR THE PROVISION OF REGIMENTAL RESERVES FOR THE NATIVE ARMY OF INDIA.

BY MAJOR H. COLLETT,

*2nd in Command of the 23rd Pioneers and Assistant Quarter-Master
General of the Kuram Field Force.*

I shall assume for purposes of the this paper that the necessity of providing a reserve for the native army is admitted, and shall confine myself to the consideration of the manner in which the want can be supplied with efficiency, and with the least possible disturbance of existing military conditions. In order to clear the ground I will first define the purposes for which a reserve is in my judgment required.

- (1) It is required to complete all native regiments to 800 trained privates immediately on war breaking out, or on other necessity occurring.
- (2) And also to fill up dépôts of regiments ordered to take the field with at least 200 effective soldiers ready to replace casualties in the ranks, and as a nucleus for the training of recruits.

In short, a reserve is required to render regiments effective for field service, and to maintain them so. I do not contemplate the formation of battalions composed of reserve men, as in the armies of Europe. For India, I think we only want an organization capable of completing the regular battalions to the service strength immediately on the declaration of war, and keeping the ranks full until we have had time to enlist and train recruits.

The converse of such an organization has been abundantly illustrated during the late campaign. War was virtually declared on the 23rd September, when Sir Neville Chamberlain's mission was refused entrance into Afghanistan, and orders were shortly afterwards issued for all regiments of native infantry to recruit up to 800 sepoys. The consequence was, that the Punjab was immediately over-run with recruiting parties from different corps, all bidding against each other,

and regiments in the field had to send away their best non-commissioned officers and men, and even in some cases British officers, to recruit. Hundreds of men were thus enlisted who ought never to have been admitted into the service; the efficiency of the fighting regiments was impaired, and at the end of the campaign we had only a number of half trained raw lads to supply the numerous vacancies which sickness, death, and desertion had caused in the ranks.

It is impossible to conceive a more forcible illustration of the straits to which an army may be brought by the want of forethought and organization, and it is very fortunate that a prolonged campaign did not place an extreme strain on our so called system.

If returns were called for from regiments which have been employed during the late operations to show (1) the number of men who took the field last October, (2) the number who remained *effective* on the 24th May 1879, and (3) the number of half trained recruits borne on the rolls, the results could not fail to be very instructive.

The general principle on which any reserve should be formed must be *local* and *regimental*. I mean that every man borne on the rolls of the reserve must belong to the regiment in which he will be required to serve—and yet, except in the event of his being called upon to join the colours for a war, he should not be compelled to leave the province in which he lives.

These principles must be steadily kept in view.

There are it appears to me only three methods in which a system of reserves can be organized viz :—

- (A) The regiments may all be localised as in Germany; in this case they can put their own reserve men through the annual training.
- (B) Two or three battalions may be linked together, one of which can be stationed in or near the district from which the linked battalions recruit; and this battalion can act as a *depôt* in training its own reserve men and those of its sister corps.
- (C) Reserve centres can be formed at convenient places, with a fixed establishment of officers &c., who would have charge, of all the reserve men living within certain adjacent districts pay them, and put them through their annual training.

Various other schemes have been proposed, but all which are in any degree practicable, will I think be found to agree in principle with one of the above.

I will consider each method in detail.

First method.

(4) proposes the localisation of all regiments. This I regard as dangerous from a political point of view, and as highly undesirable for reasons of military efficiency. Politically, the dangers of the plan are obvious. We hold the country on the principle of coercing one nationality with the troops raised from another: that is, we keep our Sikh battalions at Peshawar, and would quell a disturbance at Amritsar with Muhammadan or Hindustani regiments. It is therefore necessary as a general rule to quarter regiments in places at a distance from the district which supplies their recruits.

From a military point of view the adoption of the German system of localising regiments is equally objectionable. We may for special reasons apply the principle to a few corps such as the Goorkhas, the Guides, or the Muzbee Pioneer regiments without loss of efficiency or even with profit, but not I think to the army at large.

Localisation as a general rule means slackness of discipline; a low standard of drill; of equipment; and standing still instead of progressing. The men and officers get too comfortable and form all sorts of local connections. They lose the true military spirit and generally deteriorate, becoming less fitted and eager for field service than if they occasionally shifted their quarters, and thus saw a little more of other regiments and of the world. The evils of localisation are not yet apparent in the frontier regiments, because constant expeditions and active service have kept them in a high state of military efficiency. But if these conditions should cease to exist, and if the Force remains local another ten years, it will probably fall below the standard of the regular regiments, as have those which are localised in Assam.

For these reasons, I think that any scheme of reserves which involves the localisation of corps is vicious in principle, and should not be entertained. Localisation by Presidencies is an altogether different matter and ought certainly, I think, to be continued, but the principle cannot be successfully applied to smaller units. It may also be added that localisation can only be effected with class regiments.

I will now pass on to the system of linking battalions contained in proposal (B).

(B) This plan supposes, say, three regiments which recruit from the same district being linked together, one of them being always kept in the home district and the other two being on what may be termed foreign service. The home battalion would of course be changed every three or four years, so as to give each a turn in their own country.

There are many advantages, though in my judgment most of them are apparent rather than real, in applying the system of linked battalions to the native army, and it is that which is most frequently recommended for adoption by writers in the public press. The principal advantage concerns the British officers. By treating three battalions as one regiment, we get a body of 21 officers, to whom the principle of promotion by "seniority tempered with selection" can be advantageously and safely applied. In our regiments of 7 officers, on the other hand, the promotion cannot possibly be regimental and must rest with the Commander-in-Chief.

In practice I do not myself think that this supposed advantage of linked battalions has really much weight. The battalions must in fact be distinct military units, and though an officer might be occasionally transferred from one to the other, no real union would take place. It would be a paper and not an actual amalgamation and so far as the good of the service is concerned I cannot see that much would be gained by its adoption.

The linked battalions would seldom or never be quartered together, and the bond of union between them would be even more shadowy than is the case in the British Army. It would not in fact practically exist save in the pages of the Army list. The adoption of the system would also involve the complete reconstruction of the Bengal Army, for it can only be properly worked with class *regiments*, whereas our military constitution is, for the large majority of corps (40 out of 45), either mixed or by class *companies*. I will not here enter upon the question of the relative advantages of class companies, class regiments, or mixed regiments, as this point was settled twenty years ago, and has now little more than a theoretical interest. It is sufficient for me to take the problem as it exists, and not to devise a system of reserves which is applicable only to an army differently constituted to the one we have got. It is proverbial, that when the Indian Government plants a tree, it is always pulled up after two or three years to see how it is getting on; but it is earnestly to be hoped we are not going to see this operation practised on the native army. Linked battalions must be class battalions, that is they must be recruited from the same district or there will be nothing gained by linking them.

In the Bengal Army there are roughly speaking I believe * 27 mixed regiments, that is, with Hindus and Muhamadans, from widely separated districts mingled indiscriminately in the ranks. † 13 class company regiments, that is, corps having, say, 3 companies of Sikhs, 2 of Pathans, 2 of Punjabi Muhamadans and 1 of Dogras : and ‡ 5 class regiments, that is, corps composed of men of the same religion, the same nationality, and drawn from districts closely adjacent to one another.

To apply the system of linked battalions to the Bengal Army the organisation of 39 regiments out 45 must be entirely changed. This must either be done at once, by a re-distribution of the materials of which regiments are composed, or spread over a series of years by ordering the cessation of the recruiting in certain regiments of particular classes.

I hardly know which plan would be the worst. By the first, the entire army would be disorganised ; by the second, the formation of a reserve would be almost indefinitely postponed. Whereas, what practical men require, is a system of reserves suited to the present army, and which is capable of instant application. I trust that I may be considered to have shown that the system of linking battalions is manifestly impossible of application to the existing army, the constitution of the regiments does not admit of it, and however symmetrical the principle may appear, it is totally unsuited to the circumstances with which we deal. It may therefore be dismissed from further consideration, and we now arrive at the third proposal.

Third method.

(C) Contains what I consider to be the true principle of providing reserves for the Indian Army. I shall therefore sketch in some detail the general principles of the system which I propose and which may be briefly summarised as follows.

* 1st	Native Infantry.	10th	Native Infantry.	36th	Native Infantry.
2nd	"	11th	"	37th	"
3rd	"	13th	"	38th	"
4th	"	16th	"	39th	"
5th	"	17th	"	40th	"
6th	"	18th	"	41st	"
7th	"	33rd	"	42nd	"
8th	"	34th	"	43rd	"
9th	"	35th	"	44th	"
<hr/>					
† 12th	Native Infantry.	22nd	Native Infantry.	27th	Native Infantry.
19th	"	24th	"	28th	"
20th	"	25th	"	29th	"
21st	"	26th	"	30th	"
	"		"	31st	"
<hr/>					
‡ 14th	Native Infantry.	23rd	Pioneers.	45th	Native Infantry.
15th	"	32nd	"		

Regiments to remain organised as at present. Recruits to be enlisted for a term of six years; at the end of this period the engagement of service to terminate, and the commanding officer to determine whether a man should (1) pass into the reserve, (2) remain with the regiment, or, (3) be finally and entirely discharged.

The names of men passing into the reserve would be transferred to the regimental reserve roll, and the men would return to their homes.

No man to be transferred to the reserve unless he wished it.

Men willing to remain in the service and whom the commanding officer might wish to keep, would be retained in the corps. Men thus re-enlisting, to do so for periods of three years; these periods of re-engagement to be renewed as often as the commanding officer might think fit; but no man to have a *claim* to stay in the service after the expiry of any such period.

No man who had twelve years service; (*i.e.*, two periods of reengagements) to be permitted to join the reserve; or to remain in the regiment, unless he had attained the rank of a naik or havildar. Men passing into the reserve would come under the reserve centre within the limits of which their villages are situated; reserve centres to be formed at convenient military stations in the principal recruiting districts; their limits to be territorial and conterminous with the divisions of the civil administration. For example the reserve centre at Meean-Meer might embrace the Lahore and Amritsar district: that at Umballa the Cis-Sutlej States and the country down to Delhi; that at Rawal-Pindi the Jhilum and Sialkot Districts; and so on.

Each reserve centre to have a permanent commandant and a permanent staff officer, whose chief duties would be to keep a register of all reserve men living within their centre limits; to carry out (with such assistance and limitations as will be hereafter detailed) the annual course of training; to pay the reserve men or old pensioners; and to arrange for the despatch of the necessary number of reserve men to regiments on war breaking out.

The pay of men in the reserve to be two rupees a month, with an additional six rupees for the month when assembled for training.

All ranks of reserve men to get the same pay except when out for training, when the havildars would get five rupees staff pay and the naiks two rupees eight annas.

Havildars to be appointed from the reserve men in the proportion of five per cent; naiks in the same proportion.

Pensioned native officers to be attached to reserve centres in such numbers as might be necessary.

The drafts of reserve men for regiments ordered on field service would not be accompanied by any native officers, havildars or naiks, as these men would only be required to complete the service companies up to 100 men each.

The native officers, and non-commissioned staff of the reserve would all join the depôt in the event of the regiment taking the field.

Every man in the reserves should undergo at least a month's training in the year, which should include a short course of target practice, say the expenditure of 50 rounds. Unless this training is insisted upon, the reserves will never be efficient, nor will the men thoroughly understand their liability for service. The 30 day's training (inclusive of Sundays) must be continuous, that is, the training may not be divided into periods of a week or more at a time.

The training is to be carried out under the orders of the commandant of the reserve centre. It will extend over only certain months in the year, which should be fixed with reference to the time when the claims of agriculture are least pressing.

During the period of training a sufficient number of British officers, native officers, and drill instructors should be temporarily attached to the reserve centre, by order of the General Officer commanding the division, from the regular regiments serving therein, and small additional staff allowances should be paid to them while so employed. The number of officers &c. required, to be fixed by authority at a certain percentage of the reserve men under training.

The arms accoutrements of the reserve men to be kept at the reserve centre. I consider this as essential. If collected in arsenals there will be endless delays and perhaps confusion in getting them when wanted.

The uniform for the reserve men to be kept by the men themselves, it need consist only of a simple loose Khaki blouse, pyjamas with puttis, native shoes, and the regimental pugri.

If a regiment happens to be within, or near the district in which its reserve men reside, it will undertake the annual training of its own men. For example, if the 19th Native Infantry were at Mekan Meer, it would train all its reserve men living within the boundaries of the Lahore reserve centre. This would relieve to a considerable extent the pressure on the reserve centre staff.

The strength of the regimental reserve should be *definitely fixed*, I think, at 400 or 500 of all ranks, and this number *must* be kept complete by the commanding officer, *i. e.*, he should not be authorised to re-engage a man for a 2nd or 3rd period of service unless the reserve is full. If war

breaks out, this number will give say 250 to complete the battalion up to its war strength of 800 sepoys, and 250 or 150 to join the dépôt.

When a man with the battalion completes his six years service and is passed *into* the reserve, the senior reserve man would pass *out* of it; that is, he would be struck off the rolls and return completely to civil life with no liability for further service.

If a man becomes unfit, through ill health or any other cause, for further military service while in the reserve, he may be forthwith discharged by order of the commandant of the reserve centre in which he lives, or of the commanding officer of the regiment.

If a reserve man dies, his place would have to remain vacant until a man from the battalion became available by completion of his service.

By this system the reserve would be kept free from old men. It would work somewhat as follows.

A battalion consists, say, of 700 men of all ranks. Of these about one sixth, or say 110 would probably during each year complete their six year's service or re-engagement periods.

The reserve being fixed at, say 500, one sixth of this number or say 80 would be annually required for its ranks. This would give the officer commanding 30 men to be rejected as unfit for further military service, or to be retained with the battalion.

These numbers would of course vary with reference to the number of *old soldiers in the ranks*, but not sufficiently to affect the principal of the system, which is so far elastic, that there is no *obligation* to release a good man from service in the reserve until there is a man from the battalion ready to replace him. There is no limit fixed for the reserve service, and this fact would place it in the power of the commanding officer to keep it always complete, and prevent unworthy men joining its ranks.

Assuming that the average age of the recruit is 19 years, the age of the young soldiers in the battalion would be from 19 to 25; and the age of the majority of the reserve men from 25 to 31.

By this system we secure the following advantages.

1. The large majority of our reserve men would be *under* (19+6+6) 31 years of age and therefore perfectly fit for field service.
2. The ranks of the battalion would be a mixture of old and young soldiers in just such proportion as the Government may desire.

3. A commanding officer could always get rid of undesirable men, at the end of their periods of service. The corps need never be burdened for long with bad men in any rank.
4. A Commanding officer could retain for any length of time he may desire the services of good non-commissioned officers.
5. The system has the political advantage of confining military training to a minimum number of men. In England it is the object of the Government to pass as many of the inhabitants as possible through the military mill, but this is obviously *not* the case with us. It would be a positive danger to have the entire male population trained to arms. All that we want is to have sufficient reserve strength, and to keep things going till we have time to train fresh recruits. This end the proposed system secures, for among the general population, the *only* men who had passed through the army would be either those who had been rejected for the reserve, and were therefore *ex-hypothesi* worthless, or men who had passed through both the army and the reserve and who are over thirty years of age. Such men are presumably well affected towards the British Government and not likely to take part in political disturbances.
6. The system is simple and easy of comprehension by sepoys. A man when he enlists would know that at the end of six years service he would be discharged: and either pass into the reserve for a term probably not exceeding six or eight years: or that if he were an exceptionally good soldier, he might, if he himself wished it, be retained in the regiment with a good chance of promotion.

It would be advisable to offer certain small advantages to reserve men, such as priority of having their suits heard in civil courts, the privilege of possessing arms for sporting purposes without paying for a license &c.

The rates of pay in the army would require modification if this system is adopted. I propose the following:—

Free Kit as at present.

Pay at Rs. 7 a month for the first six years.

Good conduct pay at one rupee from 3 to 6 years service.

Pay of eight rupees a month for re-engaged men from 6 to 9 years service.

Good conduct pay of one rupee for ditto.

Pay of nine rupees for re-engaged men from 9 to 12 years service.

Good conduct pay of one rupee for ditto.

I strongly urge the increase of *pay proper*, as above proposed, for the re-engaged men from six to twelve years service. It is very important to have a good proportion of old soldiers in the ranks of a regiment, and in my belief nothing will be a stronger inducement for men to stay, than to convert the good conduct pay now given into pay, of which the soldier cannot be deprived. The maximum pay that a sepoy could draw would be Rs. 10, and he would only be entitled to this during the last period of his service. It is also to be remarked that none but really good soldiers would ever get this pay, as the recipients would be the élite of two processes of weeding out.

While on the subject of pay, I desire to point out the inferior position which is occupied in this respect by the non-commissioned grades in the native infantry. The policy of Lord Napier of Magdala did much to raise the position of the native officers, and their remuneration was very properly increased in proportion with their responsibilities. The same *Gazette* which conferred these advantages on the subadars and jemadars of the army gave a sepoy his free kit or bounty on enlistment, and enhanced the rates of his good conduct pay. The only ranks which were left out in the cold were the havildars and naiks, who get now precisely the same pay as they did twenty years ago. There is no doubt that these men deserve consideration at the hands of the Government. Their expenses have of late years increased in the same proportion as those of their comrades in the ranks, and the high state of efficiency and discipline to which the native army has now attained increases both their labours and responsibilities. It must also be remembered that whatever system of providing reserves may be adopted, one certain result will be to increase very largely the number of recruits to be instructed, and that this means additional labour for the non-commissioned staff of a regiment. I think the time has now come when this subject ought to be taken into serious and liberal consideration.

It is evident that, under the system proposed in this paper, the pension rules as now existing will require to be entirely re-cast; and it is to the saving which can be effected in this branch of military expenditure that I look to re-coup to some extent the extra expense which will otherwise fall on the public purse.

The principle which underlies the system of military pensions, is to provide for the old age of those who have given their whole lives to the service of the state, and who are no longer able to bear arms; or to ensure a livelihood for men who have become incapacitated by wounds, or sickness contracted by reason of their military duty, from the performance of further service. If the pension rolls were strictly confined to the above classes there is no doubt that their length would be

very considerably curtailed. As a matter of fact, they contain numbers of men who shammed sickness to get the pension, and a still larger number whom commanding officers have got rid of because they wished to clear their ranks of encumbrances.

The regulation under which men become entitled to pension after fifteen years service if they can succeed in passing a medical board, is one of the worst and most foolish that was ever framed for the government of any army. If a sepoy has not been promoted, or if he is discontented with his prospects or position in the regiment, he begins to scheme and malingering directly he gets about thirteen or fourteen years service, and so patiently does he persist, that in the end, he seldom or never fails to attain his object. Directly this man reaches his home he recovers from his ailments, and when he comes to see his old friends in the regiment, as it marches near his village, he is hale and hearty, and every body wonders how so and so got his pension. I am confident that a large proportion of the pensions now paid are given to support men who deserve a sound flogging instead of the public money they receive. This state of things is due to two causes, first to the Government being ill advised enough to pension a man at all (except for wounds) after so short a service as fifteen years; and secondly, to the short sighted regulation which was issued during Sir William Mansfield's tenure of command, by which commanding officers were deprived of the power of summarily discharging men whom they considered unfit for military duty. Both these causes are excluded from operation by the system of service proposed in these pages.

I would give no pension at all except to native officers, havildars and naiks, and these ranks should become entitled to it after twenty-five years service, and their transfer to the pension list should then be obligatory, except in very special cases, when the men were willing to remain and the commanding officer desired to retain their services.

No medical board should ever be necessary for a man to obtain his pension save in the exceptional cases of wounds received or sickness actually contracted in the field, and all inducement to malingering would then be removed. Instead of pensions for short service men I would extend the system of gratuities on discharge, on some such scale as the following.

- (1). Men *discharged* at the end of their six years service, gratuity of three months pay.
- (2). Men *discharged* at the end of twelve years service in the ranks, a gratuity of twelve months pay.
- (3). Men discharged after completing their service in the reserve, a months pay for every years service performed with the colours, and three rupees for every years service in the reserve.

The " months pay " in all the above cases to be taken at eight rupees, and to be irrespective of good conduct pay which should not be included in the reckoning.

Thus, a man who had served his six years in the battalion, but who was of a weakly constitution, and was not considered a desirable addition to the regimental reserve would return to his village with (8×3) twenty four rupees in his pocket, at the age of about twenty five years. Again, a man who had put in his six years in the ranks and say seven years in the reserve would quit the service with a gratuity of $(6 \times 8) + (7 \times 3)$ i e., $48 + 21$ or 69 rupees, and his age would be about thirty one years. To take a third case, a sepoy has served twelve years in the ranks, but through want perhaps of natural ability, has not risen to the rank of naik, he would be *discharged* at the end of his second period of re-engagement, and would get (12×8) ninety six rupees. I do not mean to lay down exactly the above rates of gratuities as an essential part of the scheme, for the precise amount must be fixed on financial calculations, into which I have neither the leisure or ability to enter. I name them merely as approximations to the proportions which I think the different scales of gratuities should bear to each other. It is possible that smaller amounts would meet the necessities of the case, and that the scale proposed is needlessly liberal. I cannot but think that so far as the popularity of the service is concerned it will be more surely gained by liberal gratuities, than by pensions, and that this method of rewarding service will be found for less burdensome to the State than the existing system.

Considering the largely increased number of recruits that it will be necessary to obtain under any system of reserves, it will, I think, be advisable both to increase the regimental training staff and to offer inducements for men on furlough and in the reserves to obtain recruits. It is possible that a small part of the free kit money might advantageously be devoted as rewards for this purpose.

It will have been observed that, the responsibility of the commanding officer for the *personnel* both of his battalion and of his regimental reserve is an essential part of this scheme. If there is a single man of inferior physique or of bad character retained in the ranks, the commanding officer can alone be to blame. There is, I think, no doubt that this is the proper principle to adopt. No other officer is so interested in maintaining the efficiency of the corps, and no one knows so well as he, the individual characters and military qualities of the men. It is wiser to invest him with full powers of selection and rejection than to hamper his action by necessitating constant reference to superior authority. It is a matter of frequent complaint that, under the present regulations, it is impossible to get rid of men who will not criminally commit themselves, but whom nevertheless it is undesirable to retain in the ranks, and it is time that this cause of inefficiency should be removed.

Into the vital question of expense I am not competent to enter, though I am well aware of its importance. If the principle of the scheme is sound, and is approved by those who are about to sit in judgment on these matters, this aspect of the reform will have to be investigated by experts, and it is useless for me to offer any crude opinions on the subject. The almost entire abolition of the pension list would be the principal saving, and if further retrenchment of military expenditure is necessary, I would enquire whether some particular regiments of Bengal infantry might not be disbanded without detriment to the interests of the State. A regiment of sepoys is of no use on earth, unless it can be depended upon to fight and beat the Queen's enemies; and he would be a rash man who would predicate this of all the native battalions now in the pay of Her Majesty's Government. The following figures are, to say the least, suggestive. Out of 28 Hindustani regiments *two* have been employed in the field during the late campaign. Out of 17 Sikh and Punjab regiments *thirteen* have been so employed and of the four ghorkha corps *all* have taken the field.

I do not mean it to be inferred from this that our whole army should be composed of Sikhs, Punjabis, and Ghorkhas,—far from it; but these figures seem to prove that in the opinion of the military authorities at least, the Hindustani portion of the army is not fit for a campaign in Afghanistan. Now the events of the first Afghan war fully proved that, the Hindustani sepoys of that day were quite able to thrash the Afghans, and it would seem therefore, that their descendants of the present time are considered to have deteriorated in martial qualities. How far this is the case it would be difficult to say, but I am quite confident all unprejudiced officers will agree that, there are certain Hindustani regiments now in the Bengal army who are immeasurably inferior to the pre-mutiny sepoy battalions.

It seems probable that the low caste native of Hindustan is not worth much as a fighting animal, and that in enlisting *dhobies* and *mochis* instead of brahmins we have made a mistake. We may have got regiments which will not mutiny, but that is only a negative advantage, and they are not much use to the State if they will not fight. The true counterpoise to the high caste brahmin is the Pathan and the Punjabi, not the cowardly menial classes of Hindustan. Battalions composed of these materials are of positively no value whatever as "man slaying machines," and the sooner this fact is recognised the better. It is a simple waste of public money to pay, so called soldiers, who cannot be trusted to fight, however clean and neat they may appear on parade. There is no doubt, I think, that some economies might be effected in this direction without any loss to our real strength, and the subject is well worthy of the attention of all earnest military reformers.

I have heard it said that, if we possess efficient reserves the strength of battalions might safely be reduced to 500 sepoys or even lower, and that savings in the military budget might be thus effected. This is in

my judgment a mistake, and it would be better to have no reserves at all than to impair the efficiency of the active army. A regiment should be of sufficient strength to perform its ordinary garrison duties without an undue strain on the men, and even to take the field for a border expedition without calling on its reserves. This it cannot possibly do with less than six hundred bayonets, and that number should be regarded as a minimum. No system of reserves that could be devised would compensate for skeleton battalions unable to quell a local émeute, or to repel a frontier raid.

It now remains to show how the proposed system for the creation of reserves can be applied to the existing army. This must necessarily be a work of time, but I think that the end can be obtained without unreasonable delay. The first thing to do would be to name a date, say the 1st January next, after which all recruits would be enlisted under the new conditions; but it is evident that these men would not become available for the reserve until 1886, and that the system would not be in full working order until 1892. It will therefore become necessary to offer sufficient advantages to the men now in the ranks to induce them to join the reserves. Of course the reserve could not attain its full strength until at best eight or nine years after the establishment of the system, but there is no reason why a large proportion of the men now in the army should not pass gradually into the reserve within the next six years, and in this manner it would soon attain a respectable strength, and ought to number from two or three hundred in each regiment within three years from 1st January 1880. Such a measure of success is, I imagine, as complete and speedy as could be obtained by any system in which the reserves are composed of old soldiers. The details of the inducements to be offered will require much consideration. They should I think be of the nature of gratuities and only applicable to men under fifteen years service. Sepoys of longer service would be too old for the reserves, and should be allowed to disappear from the ranks under the present regulations.

There is one obvious objection to the whole system, which I may perhaps be allowed to anticipate; *viz*: will recruits enlist in sufficient numbers under the proposed regulation? For my own part, and referring entirely to Sikhs and Punjabis, I believe they will, and that no difficulty in this respect will be experienced.

I do not think that the young Sikh ever enlists with a view to a pension. He wishes to serve a few years in the army and then settle down in his village. For such a man good pay while in the ranks, a return to his home with a little stock of money in his pocket, and six or eight years in the reserve on two rupees a month for doing nothing, will I am sure prove a very attractive career. Whether the Hindustani recruit will think the same I do not know. If he does not, the scheme must fall to the ground.

H. C.

III.

TRANSPORT BY RAIL OF TROOPS, HORSES, GUNS AND WAR MATERIAL.

*Paper read at the United Service Institution on the 9th September
by David Ross Esq. Traffic Manager Scinde, Punjab
and Delhi Railway,*

COLONEL THE HON'BLE SIR A. CLARKE, K.C.M.G., C.B., C.I.E., R.E.,
IN THE CHAIR.

1. For some years back experiments have been conducted by the Military and Railway authorities, in loading and disembarking troops, horses and guns, also in despatching Special trains for short distances to test the relative advantages of the different methods.

End and side loading of vehicles, the use of stations, loading platforms, and also their non-necessity have their respective advocates.

The result of these experiments has been so ably treated by Major LeMessurier R. E., in a paper read, I understand, some time ago before the members of this Institution, that it is unnecessary for me to go into details connected with the different systems.

Although I assisted in the first experiments made by Sir Charles Reid K.C.B., in regard to "End" loading, my absence from India in 1875 prevented my being present at the more extensive experiments afterwards conducted at Delhi and Lahore during the Prince of Wales' visit.

The principal objection however which I consider can be urged against the otherwise admirable system of "End" loading is that it virtually blocks the line between any two stations while troops or guns are being loaded or discharged, and of course stops all traffic, whether Military or public for the time being on either side, which is a very grave fault. In my opinion the operation of end loading on main lines should only be resorted to, in very exceptional cases, as for instance in the event of an engagement actually taking place on or in the immediate vicinity of a line of Railway.

Stations should always be utilized for loading and unloading troops horses or guns as far as possible, otherwise the whole traffic of the Railway is disorganized and this would be more especially likely to take place on our Indian single lines of Railway with the heavy traffic

which would of necessity occur in moving large bodies of troops and war material, with possibly every crossing station occupied by trains as was lately the case.

We have had considerable experience lately on the Scinde Punjaub and Delhi Railway in the transport of Troops both in connection with the Bengal portion of the expedition despatched to Malta, and still more recently in forwarding the Army for Afghanistan.

My remarks will now be confined to the practical work done in the conveyance by rail of Troops, horses and stores, the capacity of our Railway for military movements; and briefly, the lessons we have learned from our late experience so obtained.

The movement of Troops to and from the frontier commenced, it may be said in October 1878, and ended in June 1879.

During that period we conveyed over the Scinde Punjaub and Delhi Railway system, in round numbers about :—

190,000	Troops and Followers.
24,000	Horses, ponies and mules.
8,000	Bullocks.
1,000	Camels.
500	Guns, Artillery and Engineer's Carriages.
1,400,000	Maunds of Commissariat, Ordnance and Military Stores.

In addition to the ordinary passenger and goods trains, by which large bodies of troops, and nearly all the Military Stores were conveyed, about two hundred and fifty special trains were required for the transport of this army.

The maximum number of troops and horses, carried during any month was in November, when 81 special trains ran, conveying :—

40,000	Troops and Followers.
6,500	Horses, ponies and mules.
1,500	Bullocks.
260,000	Maunds of Commissariat and Ordnance Stores.

The greatest number of Special trains, running in any one day was eight, carrying :—

4,100	Troops and Followers.
300	Horses, ponies, mules and Bullocks.
10,000	Maunds Military Stores.

The hours of starting, constitution of the trains, halts and arrival were fixed in consultation with the respective Assistant Quarter-Master-General, and there was no difficulty as a rule in arranging the time so as to suit the Military authorities and at the same time not to interfere in any way with the public traffic.

The ordinary traffic of the line was not delayed or interfered with although troops and Military Stores had in all cases the first supply of vehicles and also priority in despatch.

In each instance printed time tables were issued to all the stations concerned, showing distinctly the times of arrival and departure, and where other trains were to be passed or crossed, and halts for refreshments.

Copies of these time tables were furnished to the respective Assistant Quarter Masters General and Commissariat Officers, and also to the Officer in Command of the troops proceeding with the Special train.

When the urgency of military requirements did not permit of sufficient previous notice being given to issue printed time bills in the usual way the necessary instructions to the traffic staff were telegraphed to all stations in regard to the running of Troop Special trains.

The only way in which the public suffered, although I believe the natives considered it no hardship, was the substitution of covered wagons for third class carriages, the latter being all required for the conveyance of troops

To adapt these covered wagons for the carriage of Passengers, the operation was very simple and quickly effected. The two upper iron panels of the doors on each side and two panels at each end were removed, which afforded sufficient ventilation.

These vehicles similarly treated with the addition of breast bars fixed across the wagon were admirably adapted for the carriage of horses 8 were loaded in each wagon 4 at each end with the horses heads in the centre, allowing space between, for syces, provender and harness.

About 250 wagons were altered for the conveyance of ordinary 3rd class Passengers and Cavalry, which enabled the Scinde Punjaub and Delhi Railway to meet all requirements by the military authorities, and also for the conveyance of the regular traffic of the line.

The ordinary horse-boxes were in all cases used for officers chargers.

The weight of stores despatched, 50,000 tons only, represents the quantity booked under Government warrants, and as the greater portion of Commissariat supplies were sent by traders these figures only approximately shew what was actually forwarded by rail.

On the other hand the number of Troops and Followers conveyed, 190,000, may seem high, this results from each separate despatch of troops being shown as a fresh departure; thus a number of regiments were concentrated at Mian Meer, Mooltan and elsewhere, in the first place; and remained there for a few weeks before proceeding to the front; such troops, of course are reckoned twice. Each despatch involved nearly the same amount of work, with the exception of haulage to the Railway Authorities, as if the regiments had gone at first right through to their destination, at least so far as collecting stock, embarking and disembarking and arranging time tables were concerned.

At Umballa when the 10th Bengal Cavalry left for Malta we loaded a troop of 80 horses in 10 minutes from the ordinary platform. As a rule there was greater trouble and delay, in trucking the grass cutter's ponies than with the Troop horses, the former frequently had to be thrust into the vehicles by physical force.

The average time occupied in loading up a Squadron of cavalry consisting of,—

- 8 Officer's.
- 128 Rank and File.
- 92 Followers.
- 130 Troop horses.
- 21 Officers' charges.
- 165 Maunds baggage and ammunition.

was about 1 hour and 30 minutes but with platforms of sufficient length and height, this could be easily reduced to one hour, and about the same time should be allowed for discharging.

I am aware that this is nearly double the time occupied at previous experiments, but as these horses were proceeding on Field Service, the Commanding Officers, as a rule, exercised great care in loading the horses, and allowed no undue haste in case of injury to the animals.

We had no opportunity of ascertaining fairly, the time taken in loading guns as our platforms were generally too low, and the opening in the sides of the trucks too narrow to prevent of a proper test.

A number of Camels were forwarded by rail; but the process of loading them in the ordinary way is very tedious and somewhat cruel

to the animals. They should, I consider, be made to kneel, secured in that position with ropes and tarpaulins and then slung into the wagon with a crane. Four can be loaded in a high sided truck with their heads towards the centre.

The speed of the Troop Specials averaged about 21 miles per hour, exclusive of stoppages, which were fixed by the Military Authorities. Loads averaged 33 Vehicles per train.

The Troops, horses, Guns and Military Stores were all conveyed with perfect safety, and the Special trains ran punctually; notwithstanding a very heavy public traffic which passed over the Railway at the same time, and a sickly season to contend with, at times 25 per cent of the staff were prostrated.

For some time we had fifty trains entering and leaving the Lahore Stations daily which will give some idea of the heavy work that had to be conducted, and this on a single line of railway.

All the arrangements with the Quarter Master General's and other Military Departments, and also the Officers in Command were conducted with the utmost harmony, and a mutual desire to assist and promote the main object in view was apparent on all sides.

Some time previous to the declaration of hostilities with Shere Ali, I prepared a Troop Time-table showing the maximum carrying capabilities of the Scinde Punjab and Delhi Railway, assuming that ordinary traffic was stopped and that we had sufficient Engine power, and also that the necessary platform and siding accommodation would be provided at the rest and terminal stations.

It may be interesting here to give a summary of our powers of transport if any great emergency was to arise. The Time-table for Army trains referred to, provides for 11 trains running each way on the Lahore and Mooltan Section, and 15 trains in each direction on the Lahore and Delhi Division. This is the maximum number of trains that could be run with a load of 35 vehicles at a speed of 20 miles per hour, with the existing number of crossing stations, and allowing stoppages for breakfast and dinner varying from $1\frac{1}{2}$ to $2\frac{1}{2}$ hours.

Working the trains, in this manner, and with our Covered Goods Wagons, converted as mentioned for the carriage of troops and horses we should be able to concentrate on Lahore, from the Mooltan and Delhi directions, without assistance from other Railways, a force equal to,

- 3 Batteries of Artillery.
- 2 Regiments of Cavalry.
- 3 Do. European Infantry.

5 Regiments native Infantry.

or a total of 7,000 men of all arms every 24 hours.

The result of an estimate of the rolling stock necessary to keep the trains in the Special Army time-table running, shows that we have sufficient accommodation,

1st for officers.

2nd for horses.

3rd for guns.

4th for baggage.

5th for ammunition (our iron panelled covered wagons will answer this latter purpose).

We would however be short of 2nd and 3rd class carriages for men and followers by at least 400 vehicles, but to meet this we have about 800 covered goods wagons available, which could be utilized in lieu of the deficient stock, if say 500 wagons were fitted with moveable seats for men and sufficiently ventilated by removal of the iron panels. We would therefore have really no extraordinary difficulty in providing the requisite vehicles for all the trains mentioned ; so it is not too sanguine a statement to make that 40,000 troops of all arms could be brought from Gazeabad to Lahore in 10 days, and about 30,000 from Mooltan to Lahore in the same time, or a total force of 70,000 with guns, horses and stores complete.

The total number of vehicles at present on the Scinde Punjab and Delhi Line exclusive of horse boxes, suitable for horses, is 130, which will only accommodate 980 horses if all could be used, at the same time, but as 10 per cent of all rolling stock, must be allowed for, as under repairs, it would be requisite to fit up about 425 additional vehicles of our covered Goods wagons to carry horses in the same manner as was done with the 100 vehicles which conveyed a part of the Indian Contingent to Bombay when en route for Malta. It would be also necessary to construct a dozen loading boards for every additional 100 wagons of the approved type.

This estimate does not provide for rolling stock being detained during the necessary halts en route for sleep, but to meet this, and to prevent the vehicles standing idle while the troops are resting, I would make the following proposals.

If the military authorities require halts to be made at the regular rest camps, and the stoppages do not exceed in length those shewn in the time table, it does not matter whether the halts take place at one, two or three, different stations, so far as the carrying capabilities

of the line for military purposes are concerned, but if the halts are in any way lengthened, it will at once curtail our power, as plant and engines cannot be worked round so quickly.

If a real emergency arose of the kind for which a special Military Train Service would be necessary, the main object of the Commander-in-Chief will probably not be so much the convenience of the Commissariat Department to provide food for troops en route at the fixed places where they have the requisite establishments in time of peace, as to push troops to the front as quickly as possible, and when generals have this object in view, the usual practice in campaigns is to serve out cooked rations for 2, 3 and even 4 days and merely halt to supply beer and rum or for other necessary purposes.

When halts have to be made of longer duration than those entered in the Time table, in order to enable the troops to have a night's rest, such halts in an emergency should take place at distances about 200 miles apart. These halts would not necessarily interfere with the time table, although the stoppages are not specially arranged for.

All that is required is say, if No. 10 Up Train from Ghazeeabad carrying troops which are to rest 12 hours at Meerut Cantt., that No. 10 should for that day become terminal at that station and subsequently continue its onward journey as No. 22 or 24, which may possibly bring troops that are also to halt 12 hours there, or another body of troops which had previously halted at Meerut may continue their onward journey to the time of No. 10 and so on, as there will be a constant flow of vehicles downwards, there should be no necessity for even detaining trains for such halts, the Carriages might at once be returned to the junction at Ghazeeabad and others collected from Down Trains to make up their equivalent by the time Troops were ready to move on again.

Another plan is perhaps preferable. The military authorities might set certain trains apart to carry Infantry, others artillery and others Cavalry. Suppose No. 2 Up Train from Ghazeeabad to Meerut brought daily a European Infantry Regiment and No. 4 carried daily a European Regiment from Meerut to Mian Mir, in the same manner, No. 18 Up could convey a European Infantry Regiment from Ghazeeabad to Meerut and No. 20 could carry a European Infantry Regiment from Meerut to Mian Mir. This example gives two European Infantry Regiments 12 hours halt each at Meerut, while immediately one regiment disembarks another gets into the same train and proceeds onwards.

To elaborate this system it would be necessary to have the different army time tables for the whole of the Indian lines before the Officer regulating the movements, but there should not be the slightest difficulty in issuing the instructions necessary to give those concerned a clear idea of what was required.

The Quarter Master General's Department would merely issue orders that certain trains on given lines and between certain rest camps should carry any particular arm of the service, Artillery, Cavalry or Infantry as may be decided on, and that the troops travelling in such trains should halt at certain rest camps. This ought to ensure the utmost regularity in the movement of trains and in giving all troops regular intervals of rest with the minimum sacrifice of time and efficiency in utilizing the rolling stock.

To carry this system out thoroughly, it would be necessary that stringent orders be issued that troops, horses and baggage be unloaded at rest camps or destination at whatever hour the train may arrive.

The first halt of troops beginning a long journey would probably be longer or shorter than others, but subsequently with proper arrangements, they would fall into the regularity of the time table.

In order to give full effect to this plan it would only be necessary to have a shunting Engine at each rest camp to shunt off, or on, the regimental baggage as required and the same with the horses and guns for cavalry and artillery, which of course, would require to halt as long as the men.

The heavy guns might however cause some lengthy detention to trucks, but of this stock each Railway has an ample supply and to spare, and nothing would be lost by such detentions.

A troop time-table would accordingly have to be prepared for all Railways, and one distinctive letter or number should indicate each Up or Down Troop Train throughout between Calcutta, Bombay, Lahore, or Kurrachee as the case may be, so that the Quarter Master General may be able to order say, train A or train No. 6 to run on any particular day and between any given points. Train A might be running on the same day from Howrah say to Assensole or between Kurrachee and Sukkur, or Meerut and Lahore, so as to suit requirements and the convenience of troops.

It is here necessary to state that the calculations as to plant available are made under the assumption that the heavy supplies of Commissariat and other stores for consumption during the Campaign, or at least sufficient for some weeks or months have been forwarded previous to the despatch of troops. After the army has been conveyed to its destination by rail, then the rolling stock will again be available for the transport of any quantity of Commissariat Ordnance or general military Stores that may be required to follow

When the Troops are to be concentrated on one point, or in one direction as for instance on the Trans-Indus Frontier, the Up Trains should have a clear road, and any giving way for necessary delays in crossing should be arranged as regards the Down Trains.

Three thousand five hundred Troops could be landed at Lahore daily, without disturbing the ordinary traffic of the line, or half the number of troops as compared with what has been shown would be conveyed if the public traffic was entirely stopped.

This allows for 6 Up and 6 Down Troop Specials between Mooltan and Lahore and 8 each way between Delhi and Lahore.

The regular traffic is estimated at the minimum; 11 Passenger and Goods Trains in each direction, inclusive of through, Mixed and local trains.

I have shortly stated what was actually done in regard to the transport by rail of the army for Afghanistan; and also what the Scinde Punjaub and Delhi Railway was prepared to perform under certain emergencies and conditions, and I will now as briefly detail what lessons or hints we have learned from the experience thus gained.

I presume no such strain, as we have just contemplated could possibly be put on the railways, either in regard to providing transport for such an Army or furnishing the necessary rolling stock. But assuming that carriage was wanted for even half the number as last stated viz: 3,500 troops of all arms per day, still, before we could be equal to convey this number in a thoroughly efficient manner, the siding and loading platform accomodation at Military Stations such as Meerut, Umballa, Mean Mir and Mooltan, where there are rest camps, would require to be largely increased.

Loading platforms at each of these stations equal to at least 3 Troop Specials, that is, one for infantry, another for cavalry, and a third for artillery or for commissariat and ordnance stores would be necessary. With the loading banks and sidings so arranged that the shunting of any one train would not interfere with the next; nor yet with the ordinary traffic or main line.

The platforms need not be expensive, but might simply consist of earth work with a breast wall. The loading bank sloped or ramped behind, and at each end so that access could be had at all points by men, horses or guns to the vehicles composing the train. The slope also would prevent all danger to refractory horses in case they backed and refused to enter the wagons. The old rails rejected from the main line would be admirably adapted for the purpose of these sidings.

This extra accommodation would also be useful, during a heavy grain traffic now of frequent occurrence in connection with famines, scarcities, or export trade, or in storing spare stock during a slack season.

Troop platforms should, in all cases be nearly level with the floor of the wagons; so that horses and guns may be easily laden; such an

arrangement is also more convenient for troops, baggage and stores. Each loading bank should be long enough to hold a complete train of 35 vehicles with engine and tender clear of all other lines.

The platforms in some cases not being long enough, the trains had to be loaded up in sections; first the troop horses, then the officers' chargers and thirdly the baggage. If the train could stand complete alongside the platform, one hour would be sufficient to load a special train of 35 vehicles containing a squadron of Cavalry. On more than one occasion we trucked a troop of 80 horses in 10 minutes.

I attach great importance to the additional sidings and loading platforms mentioned, as one of the greatest difficulties we had to contend with in the recent despatch of troops to the front, was the want of sufficient lines and platforms. The marshalling of Troop trains, embarking and disembarking men, horses or guns, ought to be effected without, in the slightest degree, interfering with the ordinary traffic or blocking the main line. Further, the platform should be constructed on the echelon or step system. So that the moving of one train may not interfere with any other.

For the carriage of guns many of our open trucks are not well adapted, as only about five feet of the side flaps fall down. These should be made to open back on hinges from end to end of the wagon.

The great advantage of having the goods stock so constructed as to be easily convertible to suit for the carriage of troops, horses or 3rd class passengers has lately been most apparent.

In any case of emergency, these wagons fitted with wooden planks for seats could also be easily adapted for the transport of European Infantry. Native Passengers seem to prefer them without alterations, as they are thus enabled to squat down or recline on their bedding.

From 30 to 35 natives can be comfortably carried in the goods wagons during the cold season, and about 30 in the hot weather. Brackets should also be fitted up at the ends to hold lamps for night travelling.

Three hundred of the Scinde Punjab and Delhi wagons are now being permanently altered so that at a moment's notice they can be made available for the conveyance of Troops, Horses or Passengers.

The breast bars for the horses are secured and slung from the roof of the wagon when not in use, and ventilation is obtained, without the entire removal of the side and end panels.

The new loading boards lately introduced, connecting the platform with the floor of the wagons, have much facilitated the trucking of horses; this board has moveable iron catches attached to the sides,

so as to fix the wagon's doors at right angles to the truck and thus, not only forms a lead, but also prevents the horse's feet from slipping between the wagon and platform.

We found the ordinary iron panelled goods wagon with the floors covered and all chinks carefully closed quite safe for the carriage of gun powder and ammunition.

With Railway establishments kept down to the very minimum, and only strong enough to provide for the conduct of the ordinary and regular traffic of the line, the Military Authorities should give the earliest possible information in the event of an anticipated large movement of troops, so that timely and due provision for extra staff may be made.

As this however may not always be practicable or even advisable, Sir Andrew Clarke's proposal to establish a Military Railway Corps would in my opinion best solve this difficulty; that is to have soldiers trained in the different branches of Railway work, so that in the event of war when an extra pressure is thrown upon Railways, these soldiers, would be available as guards or for other duties for which they might be fitted; reverting to their regiments after the pressure was over.

Another point is that in an emergency, when the carrying and running capacity of railways are taxed to the utmost, orders for the movement of troops should be issued by one central authority in the Quarter Master General's Department, giving due and definite particulars as to departure, halts, arrival, destination and constitution of Troop Trains or for special trains conveying military Stores or Live Stock.

This is to prevent demands being made at one and the same time from two or three different points for special troop trains, when probably there is only sufficient stock for carriage from one station, and it would be necessary to decide which was the most urgent movement so as to give precedence.

One Central authority regulating priority in the despatch of troops would also prevent the unnecessary haulage of trains to certain points, perhaps only to find on arrival that orders had been changed and that the troops were to remain or probably to march by road.

The orders from the Quarter Master General's department should also be communicated direct to the Traffic Manager of each Railway.

Military Stores should never be loaded up or forwarded until their ultimate destination by rail is definitely known, as if wagons so laden

are detained, the work in the station yard is seriously interfered with. These wagons take up the already limited siding accommodation, impede free working, prevent rolling Stock being employed or fully utilized in the conveyance of other traffic, and altogether cause general confusion.

To shew that the carrying powers of the Scinde, Punjab and Delhi Railway, as stated in the foregoing, are not over estimated, I may mention that in connection with the recent Hurdwar Fair, during 18 days in April, we carried about a quarter of a million of Pilgrims in addition to the ordinary traffic of the line as well as conducting considerable Military movements; or on an average nearly 14,000 per day. Of course to do this, all description of vehicles were employed, Goods wagons, covered and open; Cattle trucks &c. It can, however, be understood that the conveyance of these pilgrims was an easy matter as compared with the transport of an army.

With direct Railway communication now established to the seaboard at Karachi, Troops should, if necessary, be concentrated at Lahore in two or three days, and as the harbour now safely admits ships and transports of the heaviest draught, the Military Authorities have an immense power in their hands in addition to the facilities already existing at the ports of Bombay and Calcutta.

The port of Kurrachee however, has the great advantage of being two or three days nearer England not only on account of the shorter distance from Aden, but it is also favored by the direction of the currents during the monsoons. So that in the event of any great crisis in the history of India necessitating troops being urgently sent from Europe, Kurrachee doubtless must be the port of arrival.

I cannot conclude these brief remarks without referring to the enormous difficulties which the Commissariat and transport departments had to encounter and surmount in the conveyance of stores during the late campaign from the termini of the lines of railway to the front; and how these difficulties would have been reduced to the very minimum if the far seeing views of the chairman of the Scinde, Punjab and Delhi Railway, Mr. W. P. Andrew, had been carried out viz: the construction of railways to the mouths of the Khyber and Bolan passes, which he has so earnestly and persistently advocated for the last 20 years.

Surveys and estimates were also prepared I believe about the same time for the information of Government.

Our late experience proves the soundness of Mr. Andrew's views and no doubt his original schemes will be carried out in their integrity; the necessity for their immediate adoption has certainly made itself most manifest.

THE HON'BLE SIR ANDREW CLARKE remarked, that as he saw several gentlemen present interested in the Railway communications of the Country, he had no doubt they would like to offer some observations or suggestions on the subject of Mr. Ross's paper, which the meeting would be glad to hear.

COLONEL MEDLEY said that Mr. Ross's paper had been so good and practical that it covered all the ground. The first idea which he thought would strike everybody was the enormous carrying power of a Railway compared with a Road. One practical point which arose in connection with this was that the carrying power of a single line was very much increased by the numbers of crossing stations. Fortunately before this heavy traffic had come upon the railway they had had a very heavy famine traffic under the influence of which a considerable number of extra crossing stations had to be put in and which very greatly increased the carrying powers of the line. It was difficult to say of course at what distance exactly, the single line crossing stations should be put in, but the average was about six or seven miles on the S. P. D. Railway.

He quite agreed with what Mr. Ross had said as to the importance of having separate platforms and sidings for military purposes. At Mooltan they were found so necessary that *kucha* platforms had to be put up as quickly as possible. The Lahore platform had to be lengthened; an urgent requisition was made for a platform at Meerut; and one had also to be erected at the Meean Meer station, west, on the Mooltan line. There was no doubt that every station to or from which troops were likely to be moved should have a separate siding platform quite apart from those used for the regular traffic.

As to the covered goods wagons that were used for horses, Mr. Ross had said that eight horses were comfortably put into each. He thought however that in the case of large horses they were rather cramped for room in the ordinary pattern of wagon, 16 feet long. In the new pattern for wagons ordered by Government the dimensions were 18 feet long and he would certainly recommend that in all future wagons Government should stick to those dimensions as affording sufficient space for the accommodation of 8 large horses, with reference to the patterns of carriages for troops, the Scinde Punjab and Delhi Railway Company were now converting a large number of first, and old composite carriages, into third class carriages on the American principle which he thought would be found well adapted for troops and was far better than the present pattern of third class carriages. They possessed the advantage of having a passage through the centre of the carriage with end doors, and in these carriages men could walk about and stretch their legs, and there might be no halting, if emergency required it, for you might tack on a *buffet* or *restaurant* carriage and give the troops their food on the road.

This pattern of carriage also has a privy attached to it. These were all the remarks that now occurred to him. Mr. Ross's paper, combining as it did, so much practical experience, was he thought very valuable and interesting.

MR. MOLESWORTH said that it had often struck him that it might possibly be an advantage at the Lahore Station, where there was a junction of three railways, the Mooltan, Ghazeeabad, and Punjab Northern to run the siding right through the cantonments, joining the Mooltan, and Ghazeeabad Lines and the Military Station, in military ground, where loading platforms and all appliances might be provided, and where all the troops and transport arrangements would be under Military Command and would not interfere with the ordinary traffic at Lahore Station.

Another thing which struck him as a possibly good appliance in loading horses was a sort of Sling, which might be on wheels so as to be moved to any point of the platform; refractory horses sometimes seemed to have all the refractory powers taken out of them by being slung, and the use of this appliance might save much time and labour.

In Ceylon, when pressure on the traffic occurred, Mr. Molesworth put up seats in the goods carriages to make them available for passengers, by a very simple plan, which he described by a sketch on the board with chalk, as consisting of planks with sockets and hinges extended within the wagons from side to side. They were fitted in or removed in a moment, took up little room in store and answered very well for the purpose for which they were required.

COLONEL MEDLEY said there was one more point which he had omitted to mention and that was with reference to the iron goods wagons. It was found in Sindh in the hot weather when horses were conveyed in these wagons that the heat of the iron was so great that it burnt and blistered their skins and it became necessary to line the wagons with wood. That, he fancied would always have to be done in future.

Another point was that it was rather curious that the experiments carried on by various Committees at Lahore and Agra in loading, were not followed by the issue of practical instructions. When he went down to look at the arrangements there, he found on questioning the Assistant Quarter Master General that no instructions, whatever, had been issued for loading, as the result of these experiments which continued to be carried on under the old regulations. It seemed to him that when these Committees were formed and certain results arrived at the quicker those results were put on paper and disseminated by authority the better, even if they had to be corrected afterwards.

THE HON'BLE SIR ANDREW CLARKE admitted that there was much force in what Colonel Medley had said with reference to issuing fresh

instructions. The truth, however, of the matter was, that before revised instructions could be prepared, the first thing which had to be done with regard to the Committee's reports on the subject of experiments in loading, both on the broad and narrow gauge, was to request the Railway authorities to make very considerable alterations in their rolling stock. Whilst this was being done the recent operations on the frontier summoned to the front first, Major LeMessurier and then Colonel Macgregor, who were the officers employed in working out the details of the requisite alterations.

Little knowing what was now in the future, Major LeMessurier had only yesterday written to Sir Andrew Clarke asking for permission to come back to India in order to complete the instructions not only regarding the experiments made by the Committees, but also with respect to the still more useful results which Mr. Ross had just described. It appeared to Sir Andrew Clarke that at the present moment no paper could be read or published so opportune as that by Mr. Ross; and as it contained a great amount of useful and suggestive information, he thought it would be very desirable that all Military and Railway Authorities should have it in their hands as soon as possible. With this view he hoped he might ask the Secretary to have the paper passed through the press at once and copies sent for distribution.

In conclusion Sir. Andrew Clarke tendered to Mr. Ross the thanks of himself and the meeting for his thoroughly practical and interesting paper, which was rendered all the more valuable by Mr. Ross's recent experience in the actual movement of troops, attended, as this had been, with considerable success under the difficulties indicated in the Lecture. (Applause).

IV.

THE "COLLINSIAN (F. F.)" FIRST PRIZE ESSAY, ON THE BEST METHOD OF STABLE MANAGEMENT OF TROOP HORSES IN INDIA, AND ON THE DISEASES TO WHICH THEY ARE LIABLE FROM IRREGULARITIES IN DIGESTION, THEIR INTRINSIC AND EXTRINSIC CAUSES, AND THE BEST AVAILABLE MEANS OF PREVENTING THEM.

BY FIRST CLASS VETERINARY SURGEON R. POYSER,

(Fellow of the Royal College of Veterinary Surgeons.)

The Carabiniers.

In dealing with the above comprehensive question, it is not proposed to lay down a regime for any one station, province, or presidency, but to record observations and suggestions, which, whilst of practical value, shall apply to the country as a whole, founding them on deductions drawn from a lengthened experience and practice, both curative and preventive, over a period of ten years in Bengal, the North-West Provinces, and the Punjab, on the North-West Frontier, in Afghanistan and in the Province of Oudh.

The happiest results may be expected to accrue where the system of stable management is based on common sense, experience, and science; and where there is unity of purpose and action, with a desire and determination in each administrative and executive agent to do his own duty thoroughly and confine himself to it, there will be little or no cause for complaint; whilst a system biassed by custom, trammelled by prejudice, and perverted by inexperience and interference, must, as a matter of course, be attended with indifferent, nay disastrous results. Of negligence and want of supervision, we have nothing to say, excepting that they should not be conspicuous for their presence; a partial or entire co-existence of such influences is very undesirable. Differences of opinion, and misconceptions of duty, will occasionally run riot in the "best regulated" troop stables, and it is much to be deplored that the management of horses in health and their treatment in disease should now and then, give rise to controversy.

With this preliminary, we start by asserting that *Stables are essential to the well-being of horses, troop or otherwise, in India.*

This being an incontrovertible fact, reasonable expense should not be spared in designing and constructing buildings that shall at once be

suitable, durable, economical (in the long run) readily influenced by sanitary measures, and even portable.

The conversion and improvement of old stables will not be considered here, as individual cases must of necessity be separately met and disposed of.

Many troop horses have been lost to the service, temporarily and permanently, from want of protection from inclemencies of weather, climate and insectile annoyance. Our troop horses are only sheltered overhead, they are insufficiently protected from the prejudicial influences of hot, cold, dry or damp winds and draughts, from the sun, drifting rain, and dust. Of course some troop stables are vastly superior to others, but none are protective enough at all times and under all circumstances: they meet few exigencies of the hot, and fewer of the cold season.

It is argued that exposure, or living in the open, inures horses to the hardships of marching and manœuvre, campaigning and camp life generally, but this argument is almost unsupported, and rendered untenable when we reflect that the above conditions of the troopers' existence are quite exceptional, and that it would be but feeble policy to direct our actions by events which are *not* the rule.

The more care that is taken—short of pampering—of the horses that are bound to be kept up on a peace establishment, the more prepared will they be when required for opposite emergencies, and the public exchequer will be none the more taxed eventually.

Analogically reasoning, *we* do not lead lives of exposure from choice nor is it found compatible either with reason, health, or the country's interest to permit our soldiers to do so, just because there is the chance of an annual march or manœuvre, or a campaign once in twenty years: the contrary course is signally observed, and the contingencies and hardships of camp and war are put up with cheerfully enough when they do arise, and endured none the less staunchly. So with our horses. Give them plenty of space and air, adequate shelter and protection, good food and water, and a sufficiency of both, regular and not too little exercise; insist on good grooming and scrupulous cleanliness and sanitation, and then there will be nothing to fear whenever they are called upon to act beyond the ordinary routine of cantonment life.

With one or two exceptions, the horses of British Artillery and Cavalry are stabled, but the reverse is the case with Native Cavalry, and for which we can see no very valid reason. It is, however, to be remarked that the horses of the latter corps stand the climate of India better, being mostly indigenous, than the imported ones (Walers), which, are now, more than ever, filling the ranks of the former corps, though not better than our stud-breds and the other imported ones, Arabs

and Persians. These two latter come very nearly under the head of indigenious. It is also true that the Sowar's horse costs, or used to cost (times and prices are fast changing) about three times less than that of a British corps, but then it was purchased from a source but little patronised by Government, and it may be said, monopolised by the Native Cavalry. This it has now lost, and is not only giving higher prices, but crying out that soon it will not know how or where to remount itself. Hitherto Government has had no very direct or apparent responsibility in the native trooper's allotment, feeding, well-being or diseases, unless in the case of horses attacked by glanders or farcy, when a limited compensation is allowed.

It is to be inferred that as this class of horse becomes dearer, so will arise the necessity of providing stabling for the more expensive article. Notwithstanding his exposure, however, to all kinds and vicissitudes of work and climate, he compares very favourably with our own troopers in many ways, because the Sowar has a monetary interest invested in his mount, and this implies the observance of more than ordinary personal care.

Many of the Indian troop stables should be entirely demolished, and new ones built on virgin ground where practicable; as an instance of some of the worst, we could mention those of Meerut and Peshawur. The former are merely low, flat roofed, and narrow bullock sheds, the latter rude shelter sheds, hemmed closely in on three sides, and huddled into an inadequate space.

There are few troop stables and lines that are not over-crowded, and one of their greatest faults is the want of superficial and cubic space. There must be an abundance of both to obviate crowding, than which, with ill-ventilation, nothing militates more against the health and utility of horses, or aids more in filling the hospital. The stables are neither deep enough to afford protection from sun and rain, nor are they wide enough per stall to ensure comfort. The central passages are too narrow, the roofs of most are too low, and badly or not at all ventilated. The ranges are too near each other, and the entire blocks are in many places so hemmed in by trees, human and other habitations, offices, workshops, saddle and harness rooms, gunsheds, urinals, rears, &c., that ventilation is seriously impeded, and thorough drainage interfered with, thereby favouring the development of diseases and enhancing their dissemination. Several or many of these defects, if not all, are noticeable wherever British mounted corps are quartered, and they exist in a greater degree in most native cavalry lines.

The close proximity of stables to human dwellings is neither good nor healthy for the occupants of either in any climate or country, and therefore this needless huddling together of animal life should be studiously avoided, and corrected where existing, for in India there should be no feasible excuse of want of ground.

The worst description of troop stable in England is that over which troops live. It is warmer in winter, but more stuffy, hot, and objectionable in summer than that *best* of all stables which is *open to the roof*, and having ridge or roof ventilation. The warmth of stables under troop rooms, and the horses' finer coats, are maintained at the expense of free ventilation, which cannot be very well arranged to provide due convenience to the residents above or below.

In India, though there is no difficulty of this kind to contend against, it is very remarkable that there still exist pitched roofed stables with but little ridge or roof ventilation, or none at all. It is with the position, proximity, and character generally of the surroundings of our troop stables that we find fault, as well as with the disposition and construction of the stables themselves, all of which will meet with full and minute consideration as we proceed.

With few exceptions, Indian troop stables are too clumsily built; the pillars are generally too bulky and numerous; the end walls are not sufficiently ventilated, or ventilated too much.

They might be open above a dwarf wall of six or seven feet, or if the walls be continued to the roof to counterbalance wind pressure, they should be constructed by omitting alternate bricks above the height named.

The stable required is one that provides shelter from a tropical sun and monsoon rains; affords ample standing room; admits an abundance of fresh air; mitigates the force of hot winds; subdues the intensity of solar light, and thwarts or prevents the attack and annoyance of flies and other biting or stinging insects; gives speedy and sure exit by its spaciousness and ample ridge ventilation to the products of exhalation and respiration, to the foul emanations arising from excrementitious matter, whose decomposition and fermentation are accelerated by the high temperature; whilst it should be so constructed and arranged as to protect the horses from the cutting winds, draughts and cold of winter, (or the cold season.) The seasons of the plains of India, for which it is necessary to make these various provisions, are divisible into HOT and COLD, each bringing its own special and inseparable climatic vicissitudes; for instance: hot, dry, and scorching atmospheric rarefaction with or without wind; heat and moisture without aerial movement; a lower temperature with wind often charged with moisture and miasmata,—all conditions more or less oppressive and enervating to animal life. Then we have cold, dry, piercing and searching in its character, cold with dew, fog (to a limited extent in some parts) with or without winds and chilling rain, very cold nights (hottish days) and frost (and occasionally hail) in Upper Bengal, increasing in severity and lasting longer to the northward.

Hitherto the apparent object in constructing stables has been to afford shelter against vertical solar rays and non-drifting rain, or to

feebly meet the exigencies of the hot season. Heat is not the *only* climatic power against whose baneful effect horses must, if possible, be protected. It is high time this error was corrected. The bracing and re-invigorating effects of cold on the system are well-known facts, but cold ceases to act beneficially when the degree of chilliness or shivering is reached; then it loses its tonic influence and becomes depressing to vitality, and is dangerous when long continued, draughty or accompanied by rain. Draughts are to be avoided or the open picketting is preferable.

Cold acting on a vast surface like a horse's skin will destroy functional equilibrium, not only in that organ, but in organs that are more or less vicarious to it, not excluding those of the digestive system; a congestive condition is set up, defective secretions are induced, or functions are more or less suspended and active disease supervenes. This is what is generally understood by the result of a *chill*. The remote influence of cold artificially produced by the wind blowing on a horse's skin that is freely perspiring is often observed in the hot, dry season, on the throat and nasal chambers, causing an irritable cough, and frequently extensive mucoid defluxion from the nose. Examples of passive hyperæmia—the dark purplish or leaden discoloration—of the membranes of the nostrils may be seen in the early mornings, when the cold is most searching, before the sun has warmed the air, or exercise or warm clothing has removed the condition.

The evil effects of cold on horses, whether it results from atmospheric disturbances, such as dust storms or the monsoon rains, which are often accompanied with much wind—whether it exists as the constant condition of the cold season, its severity being at the maximum during the night and just before sunrise, no matter how or from what quarter engendered—must be cautiously watched and methodically guarded against. Less danger arises (to horses) from exposure to heat than to cold, and from the influence of either condition, shelter overhead is better than none at all, provided there are no counter-influences in the way of bad ventilation and mal-sanitation; yet, when we use this same stable to meet the exigencies of the hot season, and then expect it to suffice for those of a Punjab or North-West cold season, without making other provision against cold draught, wind, and rain than that which a couple of country blankets can give, we fail most signally at the outset of our stable management.

Warmth is as necessary to keep a horse in health, condition, and bloom as it is to us. Troop horses would be much better off in the open if they were well clothed in winter, than in many of those draught-creating fever and colic-producing buildings, yeapt stables (except perhaps during rain.) Their very construction renders them nothing more or less than a series of draughty passages. When a building is neither suitable for the hot nor the cold season, it cannot be considered a very satisfactory dwelling for horses, and we can hardly hope to cons-

truet stables that will be, without periodical alterations and additions, in a climate having so many variations of character and extremes of temperature. A new and remodelled class of stable is desirable, whilst the conversion of old ones calls for careful attention. We shall not deal with the latter, but describe plans in detail of the former calculated to approximate the desiderata expected, to withstand wear and tear, seasons and the test of time, and to furnish unquestionable advantage to our troop horses, and *eventually* to the public purse, but economy at the outset must not be too much considered ; it will assuredly come with the future.

SITE.

This for Indian troop stables should be selected on the highest and driest position, out of which there is drainage, and into which there is none: take advantage of natural formations, for though there is an elevation of only two feet above the general level, a solution to the drainage question has, to a very great extent, been gained, and the channel diminished by which many causes arise to interfere with equine health, and general sanitation. Avoid the site of old stables or buildings.

Lacking natural or geographical facilities of elevation, and presuming that other circumstances render it expedient to erect stables, the ground actually concerned should be raised at least two feet, not by excavating or removing the surrounding or adjacent earth to do so, but by carting it in, from a convenient distance and untainted locality.

SOIL.

It should be selected for its firm and adherent properties, which enhance the power to resist permeation. Unfortunately there is not much room for choice in this matter, and that which would be most recommendable is difficult to obtain, the universal nature of the soil of India being *alluvial*, and not fitted for all parts of stable flooring. As a rule, dry soils, whether permeable or impermeable, are healthy, but no soils are absolutely impermeable to water. The less organic matter a soil contains the more healthy will it be. A gravelly or calcareous surface would be a wise selection. A sandy surface without depth, and a clayey subsoil which holds up moisture, would not be a wise one. The cotton soil of India cannot be recommended. Whatever be the nature of the soil, generally, in the locality, we advise that that intended for the ground work—of both inner and outer stables—should be *prepared* if not procurable; and as some clays are as impermeable to moisture as the hardest rocks, an admixture of clay and sand, in the proportion of one of the former to ten of the latter, would be admirably adapted for floorings, for the addition of even one-twelfth part of clay to sand checks, in an extraordinary degree, the transit of water. There would be no very great obstacle in the way of accomplishing this. Such a mechanical composition will make an excellent flooring material when properly laid, rammed, and allowed to settle before use.

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Handy to the site should be a plentiful supply of water, and, of course, the purer the better. It should always be at such a distance from the stables, other habitations, drains, cesspools, urinals and the like, as to preclude soakage and contamination therefrom. Of the water supply we shall speak more fully elsewhere.

Troops stables ought to be within easy access of the men's barracks, though not within three or four hundred yards, the intervening space being as clear as possible. The facilities for or difficulties of drainage, as also the position, quality, and quantity of adjacent vegetation, woods, forests or clusters of trees, as well as external ventilation, are to be well considered, for to these, most other things ought to be subservient in building Indian troop stables.

As far as drainage is concerned, provision must be made for the escape of surface water, and for that which passes into the soil and subsoil, particularly where the rainfall is heavy. Those portions of the surface on which rain can fall from buildings should be paved or otherwise protected to prevent wear and soakage into the foundations, and water should always be carried off as rapidly as possible. Herbage is always healthy. In India it should be encouraged about all habitations, and kept in check by grazing—not by cheeling; it prevents the ground becoming hot by obstructing the sun's rays and cools it by aiding evaporation. Nothing is more desirable than to cover, if it be possible (it often is not), the hot sandy plains with closely cut or grazed grass. Avoid brush wood, and if necessary to build about it, remove it, disturbing the ground as little as can be.

DISPOSITION OF STABLE RANGES.

If ventilation and sanitation are to be kept in view, the ranges of stables should run *en echelon*. This arrangement being adopted as the best for building barracks, must, on the very same grounds, be regarded as the least objectionable for stables.

ASPECT.

There is a difficulty in arriving at a conclusion on this subject that shall not be open to some objection, but where aspect has not to become subservient to immoveable surroundings in the shape of barracks, buildings of sorts, and the geographical formations of the locality, an eastern and western aspect presents the fewest disadvantages; that is to say, no better plan can be devised than by building stables broadside on to the prevailing, and end on to the deleterious winds, if these blow from opposite quarters. It is here implied that the prevailing winds of a place are *in themselves* healthy, and we believe this is invariably true.

Yet there is not much fault to find with north-east by north and south-west by south aspects, speaking of double ranges. Single ones

should be open to the south, and have the north and end walls liberally ventilated. But in all aspects an echelonic construction must be insisted on, and a sufficiency of space allowed in, between, and around the stables. Our plans show the permanent stables running, *en echelon*, from south-west to north-east, with north-west and south-east aspects. An interval of one hundred yards separates contiguous angles of the ranges. The open or terraced lines are disposed entirely away from the covered buildings, that is, they are not constructed *between* the ranges, but run 50 yards from their outer corners on each side, due east and west, having north and south aspects. They may be said to run along the ends of the permanent stabling. In this way, not only is there a distinct division between each troop (speaking of cavalry), but each horse would enjoy, when picketted out, nearly double the space he would under cover, for half a troop would be disposed in two rows on one side, and half in two rows on the other—a decided advantage on sanitary grounds, as well as for grooming and inspecting purposes.

It is here troop horses should be picketted during the sunny part of the day in the cold season, and during the hot nights and more or less cool mornings and evenings of the hot seasons. The whole to be raised not less than 18 inches above the general level, and to slope rearwards at the rate of three per cent. Trees to be planted down the centre of these outer standings. Width over all 48 feet; picket 9 feet from and on each side of the trees, and thereby allow a depth of standing room of about 15 feet.

Division and boundry walls are not requisite; indeed their existence is a decided disadvantage to surface ventilation. Mangers can also be dispensed with, and feeding sheets, to be afterwards described, would be excellent substitutes. Advantage should be taken of the ample space offered in these outer lines. Move the horses periodically one or two yards to the right or left of their present position, and back again, thus giving the soiled parts a relief and a chance of aerial and climatic disinfection. These may appear to be of minor import, but upon them hangs a tale of weal or woe. In the hot and rainy seasons turn the horses outside every available hour, and the oftener their ground can be changed the better. Duplicate and even triplicate outer lines are invaluable. If at all possible keep the horses' heads away from a strong sun, and the covered lines free of inmates as much as is consistent with shelter and protection.

MANURE PITS.

There should be about five on each side the whole of a cavalry block, placed convenient for the inner and outer lines, walled on three sides, and nine feet square each. Earth flooring does well enough. As their contents must be removed every morning (or oftener) soon after day-light, their position need cause little anxiety so long as they are placed as far from the horses as can be, and well clear of the water-

supply. Thorough and daily clearing and cleansing must be insisted on. Latrines and urinals for Europeans and natives would be better entirely outside the boundary of stables.

MATERIAL.

The materials with which it is proposed to build the troop stables now under consideration, are to be wrought and cast iron and wood, but there can be no practical objection to the use of stone, well burnt bricks, or wood for the pillar supports or columns, provided their numbers and dimensions are reduced to about half or one-third of those at present blocking up our troop stables, whilst sufficient strength is maintained and more regularity preserved.

STRENGTH AND DURABILITY.

To secure these the nature and quality of the material must be studied, as well as the form and dimensions it shall assume. Wrought iron alone should be employed if perfect immunity from danger and accident is desired, and for pillars, posts and fittings that are most exposed to the direct force of kicks, or are at all liable to meet with rough usage from any source, this material is recommended as possessing the qualities we seek in the highest degree.

Cast iron posts are usually so light in structure as to be unfit to bear the impact of the sharp blows from a horse's shod hoof and though they look massive, they have no inherent strength, and are easily fractured. With respect to the columns and the very few fittings recommended for these stables, we would dispense with projections, flutings, brackets, points, nuts and screw-heads, and all prominent and sharp edges within reach, and against which horses might rub, strike or hurt themselves. All reachable surfaces should be round and smooth.

Calculations and measurements, which will hereafter be given, will be approximate, for though we shall endeavour to be precise, an error may creep in.

The wrought iron columns which are carried up to the roof for structural purposes are the main supports, each having a diameter of six inches. The same diameter should be preserved throughout, or if decreased, the tapering should be slight, and even then there must be no sudden reduction. The base of each should be deep and long, expanding *cone-wise* to the bottom. To fix it, concrete only is required, which, if well rammed, will keep it firm and rigid. This self-fixing base is an improvement on the ordinary one fixed in stone with lead and Lewis' bolts, and also less expensive. Wrought iron pillars (particularly if large) are much more costly to manufacture than cast ones of the same size, expensive machinery being employed, but their higher price should not hinder their adoption, as the value of wrought,

compared with cast iron, in work of this nature, is infinitely greater than can be represented by mere figures.

For harness and saddlery, which cannot be kept in stables without injury from dust, dirt, moisture, and erosive gases, brackets will be dispensed with; they are not essential even to hold the saddlery as a temporary measure, besides the harness and saddle room will be contiguous and therefore convenient.

SIZE OF RANGES, STALLS, AND PASSAGES AND VERANDAHS FOR A REGIMENT OF CAVALRY.

Each range is double and made to hold 40 horses on each side, a spare stall or two being an useful addition. For R. H. A. and R. A. each range could be constructed to hold 60 and 56 horses, respectively, three ranges for the former, and two for the latter.

Each stall to be 15 by 8 feet, exclusive of pillars, to which add six inches more. A centre passage dividing the two rows of horses is seven, and a half feet wide clear and exclusive, whilst a verandah seven and a half feet wide on each side projects beyond the base of the stall.

Wrought iron pillars should be made from plate iron, of the best quality, and have a large base cast inside them, as well as the cone-shaped base outside. So firmly do the wrought and cast iron portions unite that it is impossible to sunder them even when subjected to the severest test. We see no reason to weaken these columns by screwing in rings or other supposed conveniences and objectionable projections.

ROOFS.

To be double, the outer of corrugated sheet iron, galvanised, the inner of varnished wood, pine planking, or any wood deemed fittest. They will run parallel to each other at an angle of degrees, being separated by a space having a perpendicular of about 20 inches. The inner roof extends from the rear column heads, and ceases at a point drawn upwards from, and perpendicular to, the front columns, whilst the outer one terminating (relatively) at the same place, that is a point higher up the perpendicular,—continues its slopes seven and a half feet beyond the rear columns to form a verandah. An opening $7\frac{1}{2}$ feet wide, will be left in each ridge corresponding in width, and being immediately over, the central passage.

This opening, which affords ample ventilation from the stable and aerial currency through the inter-roof space, is to be covered by a small (ridged) roof of corrugated galvanized sheet iron, which will overlap the outer one sufficiently deep to exclude drifting rain, whilst it is raised 18 inches above it.

Varnish on the inner surface of the lower roof is recommended for its preservative effect on wood, as well as for preventing or checking absorption of deleterious gases, germs, virus, &c., it is also easily washed or cleaned, and is in many ways sanitarially useful.

The horizontal spanners, length and breadth-wise, connecting the column heads, the rafters, and other roof supports, are of wood, but a well-balanced combination of wood and iron could be employed. We propose to add to the protective character of the outer roof by attaching to its lower edge a perpendicular and an ornamental iron curtain, terminating about eight feet from the ground. There would be ample space for safe ingress and egress, and the curtain would exclude drifting rain to a considerable extent. The roof extension forming the verandah and curtain are supported by round iron brackets from the rear pillars. The north-east gable peak might be surmounted by a wrought iron vane, with copper dart and letters.

Unless it were considered that the wind pressure would be too powerful and dangerous, the inter-roof space is not to be closed in at the ends of the buildings.

SADDLE, HARNESS, GRAIN AND STORE ROOM.

Each range is to have its own two saddle or harness rooms at one end, and its grain and store room at the other. The former to be at the ends nearest the barracks so as to be handy for the men getting their saddles, &c., on going to, and leaving them or going from stables. The grain and store room to occupy the opposite ends on each side the passage, like the saddle rooms.

Gutters and launders are not recommended, as they would be useless to carry off monsoon rains, and would only get choked up with dirt and leaves, or by bones dropped on the roof by the birds.

It is argued that galvanized iron roofs become very hot. True, but they become cool as soon as the source of heat is removed, and do not retain and accumulate it for weeks or months like thick layers of mud and tiles and masonry of sorts.

It may also be said to become very cold, but the inner roof, with the inter-roof space, fairly obviates or modifies the influence of heat and cold on the horses below.

Thatch, if thick enough or if covered with tiles, is perhaps the coolest roof, but neither thatch nor tiles nor their combination can compete with iron for cleanliness, lightness, strength, durability, economy, and protection from fire and climatic causes. Flat or terraced mud roofs are too low, and with or without kunker admixture conduct heat too freely, and part with it too slowly. Though thatch under tiles

is a very cool roof, a reversion of the order of these materials makes a cooler one, but increases the danger of fire, and harbours birds and vermin. Arched or bomb proof roofs are better than flat roofs if they can be properly ventilated.

DRAINAGE, FLOORS AND FLOORING.

The system of subterraneous drainage is inexpedient for every reason; it engenders nothing but foulness and diseases of a very virulent type: it must never, on any plea, be allowed. Our troop stables in India must of necessity be surface drained, so to speak, but as this is here somewhat anomalously applied, we had better explain that fluid evacuation must either be caught *as it falls* from the horses—practical to a very great extent—or be at once scraped together, with the earth fouled, and removed to the manure pit without delay.

During the night this cannot be done, but no time should be lost in the early morning, after removing the bedding, in digging or scratching up every particle of soiled earth, and well ramming in fresh, a supply of which should always be kept handy and under cover. An ordinary urine cart should be sent round the stables twice daily to take away the urine caught. Percolation must be studiously prevented, and the dry-earth system scrupulously carried out in the stable floors. Patent wrought iron surface gutters are out of the question, firstly because there can be no satisfactory outside drainage in communication with them, and, secondly, because we cannot employ any of the useful paving materials as in England, except at an impracticable expense, unless they could be locally manufactured. We are, therefore, compelled to discard the use of patent non-absorbent bricks with their chamfered edges, grooves and checks, Welsh and Staffordshire Paviers, Dutch clinkers, and granite pitching, and look to the resources of the country for flooring materials, which are absorbent, permeable and percolative. These, of course, are serious disadvantages against which veterinary sanitary science has to contend. Kunkur, which generally occurs in rough irregular nodulated pieces, and is an impure calcium carbonate, is occasionally used as a flooring for stables. For this purpose it should, first of all, be reduced to the size of coarse gravel, and might be improved by adding a proportion of cement to assist in concretion and to increase impermeability. It should be exceedingly well rammed whilst drenched with water, and be allowed a fair time to dry. The layer ought to be not less than nine inches thick, and its surface, when finished, ought to be as smooth and uniform as a stone pavement. It is, however, quite fallacious to employ kunkur alone for stable flooring, for though it can be smoothly faced, its interstices cannot be entirely occluded by ramming: it soon affords ready percolation to urine, and besides, by constantly receiving the fall of that fluid from a height of from three to five feet—usually voided with force, and falling generally in the same place, the kunkur is washed into depressions and unevennesses, which, by and bye, when percolation has been succeeded by saturation, form into reservoirs of fluid filth, giving off poisonous effluvia. The continual movements of a horse in his stall, attrition by stamping

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predisposing agency, and even this has not been very satisfactorily supported. What occurs when a battery of horses is removed several miles away from the position in which Loodhiana disease attacked it fatally? A sudden arrestation of the scourge! which will invariably re-appear should the same horses return to the original site before sanitation has thoroughly changed the circumstances under which they were living at the time of the outbreak.

But we are digressing.

If the surface drainage of stable floors has no communication with drainage outside, it will be obvious that an impermeable material, which means an immovable and an uncontrollable one, would be the reverse of good, permitting fluids to spread over more surface than could be properly kept clean and odourless, or to lodge in parts that would never get cleaned at all. Concrete would be more impermeable than kunkur, but more expensive, less enduring, and more difficult to repair, yet, it is not unfavourably reported on in England. And as neither one nor the other can bear the constant weight and attrition of horses' feet for any length of time, it is certain that we cannot find a better material for stable flooring than a soil which is permeable to a limited extent, one which will not allow very rapid percolation, giving time and opportunity, ere fluid soaks below the surface, for its entire removal. Nothing can be more suitable than a clayey and sandy mixture, (the proportions of which have been given) which sets hard and firm after ramming whilst moist, and giving a smooth clean surface under proper manipulation. There is, too, an alluvial deposit called "chikna muttee," which when suspended in water and applied to earthen surfaces as a wash, adds much to an appearance of cleanliness, and the natives think not a little to disinfection, for they use it freely to their dwellings, often mixing it well ox-dung, which imparts a faintly green tint to the compound. I believe the term "chikna muttee" means "greasy mud;" it has that feel, and is a sedimentary earth found at the bottom of stagnant water, or where water has been stagnant. As to its disinfecting power I am sceptical, and more so when mixed with ox-dung. however, as a wash to floors and walls it is useful in the hot glaring sunshine of summer, the dull drab color being more comfortable and less injurious to the horses' eyes than the constant glare of light reflected from white (lime) wash.

Earth flooring should always be well rammed whilst damp, and have ample time, if practicable, to settle; herein consists its serviceability. Though flooring should, for the comfort of horses, be as level as possible, and all slopes as slight as will serve the purpose in view, it is patent that a gentle fall rearwards of about three per cent is advisable. There should be no other slopes.

Of course it is the central portions of each stall that chiefly become foul, but all moist and discolored spots should receive the attention

before remarked, and this imposes a duty of constant supervision, but nothing whatever should prevent its strict enforcement. Solid faeces should never be permitted to lie during the day, as there are always syces about to remove it, for not only the floors, but the feet and general health, will suffer by its retention.

On sanitary grounds the earth floors are removed to the depth of 12 inches every 6 months (or should be) and replaced by fresh soil, and I would add that this is one of the wisest acts of sanitation that has lately been introduced into troop stable management.

I agree with Mr. Collins that floors impervious to moisture, would be the best, and let us by all means have them if the drainage can be thoroughly accounted for, and Government induced to bear the expense.

Stone flags (bricks are too porous) set on, and in cement, having a gentle slope towards the centre and rear, and connected by gutters with a small cemented cistern, one to two stalls, is the nearest approach I can think of, to the employment of this country's resources. "Roads metalled with concrete, made of broken stone and hydraulic lime, have been successfully used in Scotland; a thickness of six inches has been found sufficient to stand a heavy traffic, and the plan seems well worthy of adoption in various parts of India, where good lime is abundant, and where vitrified brick might be substituted for stone if the latter is not available."—Roorkee Treatise on Civil Engineering in India, compiled by Col. Medley, R. E.) This might supersede the use of kunkur for flooring, if the drainage question could be settled. There is a patent brick made by the St. Pancras Iron Work Co., non-absorbent, hard, and yet not slippery; when laid they form a series of small grooves sufficient for drainage, but not large enough to retain the dirt, &c., of the stable, and they are so formed that when worn on the upper surface they can be taken up and relaid without at all marring the effect of the paving. In all this class of impervious flooring, the drainage difficulty might partially be overcome by the adoption of dry earth conservancy.

To enhance the cleanliness and healthiness of troop stables, we insist on the use of urine vessels, and recommend those of galvanized iron, one to two horses, and to hold about one gallon, instead of the present fishglobe-shaped earthen chatties, which are easily broken and cannot be kept clean owing to their shape and absorbent properties. For uniformity, easy package and conveyance, they should be tumbler-shaped, so as to nest. They should be daily cleaned with sand and water. Vessels of glazed earthenware each to hold about four gallons, one to four horses, should stand clear of the lines, and into them the caught fluid should be emptied, and they in their turn into the urine cart. Iron scrapers or koorpas, baskets, and brooms are the only other stable requisites for keeping the floors clean and free from filth.

VENTILATION.

The Ventilation in and around all troop stables must of necessity be accomplished by NATURAL forces, *viz.*, diffusion, winds, and the difference in weight of masses of air of unequal temperature. Artificial means are inadmissible, even inside the stables, where the temperature of the air is often identical with that outside, and, therefore, more or less stagnant during the absence of wind. To compensate for atmospheric stagnation, it is important to spread the horses over the *widest available area* in tropical climates, excluding all useless and injurious impedimenta to aerial movement, such as massive pillars, division walls and high mud mangers, natives' huts, boundary walls and stacks of grass, etc. Particular attention is drawn to those three italicized words, because their meaning, which only requires pointing out to be appreciated, is so often overlooked.

The very first principle of outside ventilation is carried into effect by disposing the permanent ranges *en echelon*, and this quite irrespective of their aspect: indeed this is the most simple and effectual arrangement in the hands of the architect and engineer to secure and maintain GENERAL perfilation: and as the Government is the chief landowner of India, there ought to be no murmurings on the score of area, for the more of it troop lines and their surroundings occupy, the more salubrious will they be for the inmates. But Veterinary Sanitary Science is too frequently set at nought (though not wittingly, simply because so few know anything about it), to render everything *convenient* to everybody, or to carry out some ill-conceived whim that temporarily staves off, but permanently increases expenditure. In stable management ventilation should stand subservient to nothing, so much are life, health and economy dependent on, and influenced by it. The relative position, too, of the outer standings to the permanent ones as regards distance, direction, extent and elevation—affording, as it is suggested they should, double the superficial, and an unlimited cubic space,—adds very considerably to the maintenance of free aerial currency everywhere.

In our plans of the permanent ranges a system of ventilation is provided that calls for no extension: its modification, according to times and seasons, is all that is requisite: part of it is uncontrollable, *viz.* that of the ridge and roof: part is controllable by the adaptation of, *open* and *lined chicks* or bamboo venetians. Diffusion is always more or less in action, yet the air inside the stables in the hot season, more particularly at night, is often stationary, hence the objection to immoveable impedimenta to atmospheric intercommunication. The use of the *chick* as a controller of the force and volume of the wind, of heat and cold, cannot be overrated, whilst its convenience and utility, durability and safety, when compared with the clumsy “jhamph” or screen cannot be over-estimated.

There is generally some wind during the hot days, often more than is comfortable, and the *chick*, without entirely arresting its movement,

divides its current into minute streams and mitigates its prejudicial influence on horses, mollifying, at the same time, the intensity and glare of solar light which is so painful to the eyes. *Chicks* are made of thinly split bamboos, strung edge to edge together. Each blade— $\frac{1}{4}$ inch or more wide—is separated by an open space of about the same width, and through which the supporting string passes cross-wise. A strong one-inch bamboo supports the top, centre and bottom, horizontally. The whole is circumferenced by a broad and strong binding of cotton or hemp webbing, a band of which strengthens the centre, on each side, perpendicularly. Another kind, more bulky, and less convenient and durable, is made of sikunder—a sort of reed. The *lined chick* is an *open* one, faced on its inner side with TAT, a strong and somewhat loosely woven sacking. The *chicks* would be suspended from the horizontal spanners, and fall against the rear iron columns: are 8 feet 5 inches wide, and reach to within two inches of the ground. The lower edge would be all the better bound with leather. They can, of course, be adapted to any stable, and last much longer where they have the protection of a verandah.

During hot and muggy weather they can be rolled up, as at night, in the hot season, when the horses are picketed out, and being under perfect control can be handled as circumstances suggest, and so as not to be obstructive to ventilation. In winter there will be a considerable difference between the temperature of the external and internal air, more especially where *chicks* are used and this causing a difference in the weight of the two masses and their constant interchange is, of itself, sufficient to carry on ventilation where the ridge is open, and where other contingents of sanitation are properly enforced. In our plan each horse has been provided with 130 feet of actual standing area, and about 200 feet including that of the verandah, and a share of the central passage, whilst over three thousand feet of cubic space can be counted on: therefore with *all the chicks* dropped, which is not likely to be often, arrestation of ventilation would be simply impossible as long as the double roof and open ridge are not under human control.

Relative to the source and course of the air on so large a scale there is but little to observe; it has to be taken as it comes, hot, cold dry and moist, charged with dust, sand, malaria or otherwise. We have discussed the instruments at our command over its volume and force. But, if malarious from an assignable cause, no opportunity should be lost to correct its deleterious influence on animal life by a kind of indirect means, *viz.*, by the drainage of marshes or swamps over which prevailing winds blow; by limiting irrigation, and, looking carefully, nearer home, to the condition of tanks, cesspools and ditches, slaughter houses, hospitals, cemeteries, urinals, latrines, urine and filth carts (which travel leisurely along the high roads under your very nose) or other receptacle or place for the wholesale deposition of human and animal excrement. Here the domain of Veterinary Sanitary Science merges into that of Medical Sanitary Science: they can only be separated by name, not by

nature or practice; indeed, the service which the former lends to humanity, when carefully and completely conducted, far exceeds that which the latter can bestow on the life of the lower species. But the public mind requires educating in this matter. The wind is a powerful carrier of mephitic and Zymotic germs from long distances: there really is no limit to its influence for good or evil. Winds exert considerable influence on the animal economy, acting by their temperature, which necessarily modifies that of the circumambient air, as well as by their moisture and dryness, and by the emanations of different kinds which they transport to greater or less distances.

Though such a plentiful supply of air is advocated, the draughts and cold of winter should be more carefully avoided than heretofore. Judging from the unprotective character of troop stables, it would seem not to be a generally accepted fact that these two conditions are inimical to the health and comfort of Government horses. The studs have seen the necessity of keeping their stock warm during the cold months, and by so doing have reduced some affections which are partly induced or enhanced by cold and draught, by about 50 per cent. Reference, is here, however, made to young stock and to some of its infantile disorders. Excepting when employed for stationary verandahs or window shades, and the like, "jhamps" are vastly inferior to chicks for our requirements. A "jhamp" is a screen made of matting secured to and between a bamboo frame: is usually slung by one end to the eaves, and supported by two crutches at the other, horizontally or at various angles. When dropped perpendicularly it excludes fresh air, and keeps in foul, is more unmanageable and more acted upon by the wind, often causes injury to horses by falling on them when passing under and frightens them by its noise; soon wears out if let down over the heel rope, which chafes and lifts it up every time the horse moves his hind legs, whereas the *chick* simply collapses upwards, lightly and noiselessly, falls unnoticeably, and wears better. As the jhamp is more exposed to rain, it soon rots and falls to pieces. Dropped to windward jhamps will keep out a great deal of wind and drifting rain, but as they seldom reach the eaves within 12 or 16 inches, rain will drift over them up to the mangers where there are no verandahs. They are generally sanctioned in Veterinary Infirmaries, but it is very difficult to get them allowed for ordinary troop stables.

Opened and lined chicks alternately arranged round low and narrow hospitals without ridge and roof ventilation, have been found exceedingly useful with a little attention to their regulation according to the weather. And, lastly, they aid materially in protecting horses from the intolerable annoyances and attacks of flies, a serious pest in the early part of the hot season and rains.

Sufficient reasons have now been adduced to bring *chicks* into note and practice.

Of natural LIGHT it is obvious there is always a sufficiency, and, half the year, a superabundance of its glare, which is considerably modified by chicks. Of artificial lighting there is no need to speak.

Where there is an enormous collection of animal life—the component life itself being large—passing more than three-fourths of its time under the same roof and on the same few feet of ground, performing every intrinsic function that maintains and pertains to existence on the same bit of flooring, too much importance cannot be given to the subject of ventilation, that is, to the removal of fouled air, and the uninterrupted supply of fresh. To be forcibly impressed with the need of this, we have only to notice the activity of the skin and respiratory organs and the nature of the exhalations of their extensive surfaces; of the character and quantity of the effluvia evolved from the excreta of the alimentary and urinary tracts, as well as from other sources which are ever tending to vitiate the atmosphere with zymotic matter.

These deleterious agents, unless removed, must, in part, be returned to the system through the medium of the very surfaces, which have, perforce of nature, rejected them as useless or injurious, if retained, to the partial exclusion of re-oxygenation, without which health fails, and is speedily followed by malignant and epizootic diseases, and a sacrifice of equine life.

Though the bane of troop stable life in India lies mainly and unquestionably in *overcrowding*, (the term is comprehensively used) there do appear to exist some auxiliary and predisposing causes, extrinsic to stable management, at present only blameable to certain peculiarities of locality, to the absence of this or presence of that, but nothing is traced out, nor is the *modus operandi* explainable.

If we refuse to acknowledge some such theory or to accept the validity of circumstances which time and experience have apparently verified, and which statistics have brought to light, how are we to believe in the immunity of some, and the liability of other stations, to outbreaks of equine anthrax (Loodhiana fever) where stable management and sanitation combined, are supposed to be identical?

Over-crowding brings its train of adjunctive agents (in producing disease) which, however, may be kept in abeyance, or rendered more active, precisely in proportion to the observance of other branches of Sanitary Science. Troop horses and their management, and the epizootic or enzootic affections that from time to time make their appearance in various parts of India, cannot be entirely dis-associated: they go hand and glove together.

Therefore it is that proper ventilation, adequate superficial and cubical space are pressing necessities, calling for closer attention with increment of temperature, and requiring to be regulated according to the hygrometric state of the air and the absence of wind.

To provide against a scarcity of grass, or the inability to procure it during monsoon or winter rains, regiments and batteries are in the habit of drying and stacking a certain portion daily when abundant. The practice of stacking it *in* the stables, (under cover) occupying several stalls at one end, is to be condemned as interfering with ventilation, &c., and increasing the risk of fire.

Neither should these stacks be built between the ranges, nor close to each other, for the same reasons, but well away from the lines, and at a safe distance from the forge and other buildings where fire is used.

TREES should not be planted within fifty yards of the permanent stables, for here their shade can be dispensed with; but there is no objection to a single row running down the centre of the outside standings. It is mal-sanitation to plant trees too close to troop stables, for they interfere considerably with the free circulation of the air, with gaseous diffusion and ventilation in general.

Speaking of diffusion, the importance, in the economy of nature, of this curious law affecting the constitution of gaseous bodies, cannot be over-estimated. It is the principal means by which the atmosphere is kept in an uniform state, and the accumulations of poisonous gases and exhalations in *all* crowded and confined localities, prevented. This law should be encouraged, or rather, should not be checked where human and animal life are massed together.

Of the many and great advantages to be derived from the existence of trees, of their influence for good in the air and gases, especially in marshy and malarious districts, there can be no doubt, yet notwithstanding all this, and the shade and protection afforded, they are decidedly prejudicial when growing low, close to, and (as we have often seen) overhanging stables, for the reason before noted. The stifling sensation about a house, backed, fronted or surrounded by trees, during hot, still weather, when there isn't a breath of air moving, and that which is stagnant is saturated with moisture, is too well known to require description, but beyond this barrier of vegetation, the difference is very marked.

Therefore do not plant trees to obstruct aerial currency, neither allow their foliage to droop, nor their branches to spring out, below ten—better 12—clear feet.

Branches lower than this are dangerous, if horses, mounted, bolt under them. Though the presence of trees is not absolutely essential, they are not only useful but ornamental: useful to protect from radiant solar heat, from dew and cold, when at any time, or for any reason, it is found expedient to vacate the sheltered stables.

Avoid the shelter of trees during storms, for we have known troopers to be injured by their being torn up and broken by the force of high winds: many of the trees of the plains are very brittle and superficially rooted. Although the subject of trees is being discussed with reference more to their shade than to the effect they may have on climate, it is to be remarked that they often grow rapidly and to a large size in the vicinity of stables, provided there is no scarcity of water, and the soil is favourable to their growth and development, because it is here they meet with a preponderance of their natural nourishment, such as ammonia, carbonic acid and aqueous solutions, the products of animal respiration (this term being used in its widest sense). They, therefore, assist in removing, by appropriation, agents that are obnoxious to health and vitality, whilst they simultaneously furnish, by evolution, an agent—oxygen—essential to existence. The healthiness or insalubrity of localities is to a great extent depended upon the amount of vegetation, for the fluid which is transpired or exhaled by its leaves, and which is almost pure water, has a decided influence on animal life.

Daubeny has shewn that LIGHT (chiefly its illuminating rays) is the main agent in influencing or modifying this transpiration (irrespective of saline and other excretions); that this process varies necessarily in amount, not only in the same latitude, with different degrees of light, but also in different latitudes according to the intensity of light which is found in them respectively, and, therefore, it is evident that this agency is much more active in *tropical* regions, where solar light is most intense, than in temperate or cold regions.

Thus, in India, it can be readily understood that the air of a thickly-wooded district will be always in a damp condition, while that of one with scanty vegetation will be comparatively free from humidity; hence a country to be perfectly healthy should have the proportion of plants to a particular area carefully considered, for, while on the one hand, too many plants are prejudicial to health by the dampness they produce, on the other, a deficiency or want of them will produce an equally injurious dryness.

The same circumstances have the same important bearing upon the fertility or sterility of the soil, and in this way have an indirect influence upon the development, health and life of animals.

These observations are not to be regarded as purely extraneous to our subject, because their consideration would the better qualify us to select sites upon which to recommend an aggregation of horses or other creatures as a permanent or temporary measure.

TRAMWAY AND CISTERN.

Returning to the permanent ranges, it is proposed to run a three feet wide tramway down the central passage, resting on iron pot

sleepers, wooden ones being so liable to decay, and destruction by white ants. These rails are to be laid from end to end of each range, and are for the purpose of conveying a small four-wheeled trolley, bedded and framed to support a moveable and watertight galvanised iron tank or cistern about six by three by two feet six inches, with an ovoid or rounded bottom. A flat bottom and corners to be avoided, so as to render its cleaning easy.

Into each end of the cistern a tap or faucet and spigot is to be fixed, guarded inside by a moveable wire grating or basket work. The cistern would be found very useful to mix the grain in just before feeding, or even to soak grain in, where the "soaked whole grain" system is in vogue. So much the better would it be if the tram line could be continued into the grain-store, the angle junction to be connected by a turn-table.

By this simple machinery the food could be quickly distributed on each side to the horses, which would soon become used to its appearance, and cease to be afraid. Cleanliness, waste, and a saving of labour would thus be ensured. If need be, the tram line might be extended to the water supply, and the same tank readily made serviceable as a carrier of water along the range, and in connection with the feeding troughs to be described, it would be exceedingly useful. Its size could of course be arranged for the number of horses each range is constructed to hold.

FOOD AND WATER TROUGHS.

Should be made of galvanised wrought iron, in two compartments. To measure over all about six feet long, one foot wide and nine inches deep; the whole of the top edges to be *inverted* to prevent waste.

Length of the bottom to be less than top by four, and its width by about two inches. The right hand third (*viz.*, two feet,) to be partitioned and water-tight for drinking purposes.

The whole to occupy the right six feet of each stall, and to lie flat on the ground in a line with the front column.

The bottom to be flat, curving only where it runs into sides and ends; there are to be no awkward angles or corners into which the grain could be pressed out of the convenient reach of the horse, no projections, depressions or perforations. For its inherent strength and durability, as well as for its cleanliness and non-absorbent properties, it is far preferable to the common country *gumlah*, no matter what its shape or whether glazed or not. Earthen *gumlahs* are too small, brittle, and absorbent. The most useful ones would be manger-shaped, and glazed inside. But unless set in a mud support, they do not last long.

E L E



The separation of one horse from another is worthy of consideration in Indian troop stables: bales are introduced in our plans by adding a wrought iron heel post, six feet high, five being above the ground, and

The most useful ones would be manger-shaped, and
But unless set in a mud support, they do not last long.

liability to fracture increasing with their size, and circular ones take up more room than can be spared.

The ordinary mud trough, whether a simple depression in or built on the ground, or consisting of a concavity scooped out in the top of a broad wall about 12 inches high, running the whole breadth of the stall, or in whatever way constructed, is not commendable, because of the continual absorption of saliva, nasal discharges, and the juices of the grain (which is invariably moistened before being given) and the tendency to become sour therefrom; besides a small amount of mud and sand must be taken up with each feed, which, if not actually bad, is not good. We condemn nose-bags of leather and canvas of every shape, because they get hard and unyielding, dirty and sour, invite choking, indigestion, and colic, by inducing voracious feeding and bolting of food; are uncomfortable, as they impede respiration; and are often left on after the feed is finished; are a source of injury to all sides of the head; are heavy and cumbrous and not easily kept clean. Feeding off a blanket spread on the ground is preferable to using *gumlas*, mud troughs, or nose bags, but this is not making a legitimate use of the clothing. We would therefore recommend the use of FEEDING SHEETS, to supersede all the ordinary methods, excepting the galvanised iron troughs.

Each horse should have a feeding sheet made of hempen material just heavy enough to lie flat on the ground in a moderate wind. It ought to be seamless and strong, but neither fine nor coarse, about three feet square, and bound on the cut edges. To each corner a strong cord loop should be attached to make it convertible into a sort of forage bag; or two thinner sheets might be opposed and sewn bag-wise on three sides, and here there is at once an article useful for a variety of purposes. Hides would be too expensive, heavy, hard, unmanageable, and inconvenient. On the single or double feeding sheet the grain would be thinly spread, and that which fell from a horse's mouth could scarcely fall beyond its edges; and the few scattered grains would be readily shaken towards the centre, and picked up without mud or sand.

No damage would ensue to it by the horse's feet, nor would they be so likely to be torn as the blankets.

To commend its adoption the feeding sheet has cheapness, lightness, strength, durability, cleanliness (for it is easily washed and dried) and general utility; it is easy of package and carriage, allows the food to be well distributed, ensures feeding from the ground, and cannot be a cause of injury, and is a sure safe guard against choking.

BARRIERS, BALES, FASTENINGS, HEAD AND HEEL ROPES, ETC.

The separation of one horse from another is worthy of consideration in Indian troop stables: bales are introduced in our plans by adding a wrought iron heel post, six feet high, five being above the ground, and

fixed ten and a half feet to the rear of each front column of support, between which a three and a half inches diameter wooden bale, nine feet long horizontally swung at a height and about two feet six inches, on the swing hook principle, said to have been invented by the late Staff Veterinary Surgeon W. Partridge and which allows the bale to release itself when a pressure exceeding two cwt. is thrown on it. This kind of barrier does not impede ventilation ; it guards against one horse kicking another, and obviates the use of heel ropes. It is adopted in the most recently built cavalry stables in India, *viz.*, at North Trimulgherry Madras Presidency (1874-75). In these stables there is no centre passage, but in its stead, a ten feet dwarf wall.

Where there is a centre passage, and no wall, bales could not be employed without heel ropes, unless similar barriers swung in the opposite direction between the head columns ; they are recommended to prevent horses getting into the passage and at each other. For the various and valid reasons set forth in former articles, mud division walls are condemned.

In default of bales and partitions, the troop horse must be tied by the head or tethered by a fore foot, as well as by a single or double heel rope, unless he has space to move round the point to which his head or foot is fastened. All things considered we accede to the use of the single head-rope (double in special cases) and the bifurcated heel-rope, the latter being more or less indispensable in camp and outside picketting

Accidents are liable to occur from kicking where the head or fore foot only is fastened, though a marked absence of injuries has been observed where heel-ropes were entirely discarded, except in the case of vicious horses. In the "Veterinarian" for 1871, we recorded many instances of fracture of the pelvic (hip) bones, resulting from the use of heel-ropes. Young stud bred and Waler remounts invariably get cut and chafed in the hind heels, and about the legs, until they become accustomed to them. In the Stud Depôts they are not used. To what are these head and heel-ropes to be attached? The old-fashioned wooden peg cannot be given up entirely, but in permanent stables it might be abandoned for an iron ring slipped on to a piece of strong telegraph wire bound twice round and twisted over a large and well-baked brick, which should be buried about 18 inches below the surface of the flooring. The ring should be 2½ inches diameter, work flush with the floor, and lie flat on it when out of use. This arrangement would be a fixture, and there is no reason why it should not be so, and provided by the Government. Old telegraph wire is obtainable almost everywhere and admirably adapted for this kind of fastening. In loose sandy soil or any ground, excepting rocky, a loop of rope bushed under-ground on itself, on a bunch of brambles, a stone, or bit of wood, makes a firm, but temporary tethering, point.

The wooden pegs often do serious damage to horses that have drawn and broken away with them, attached to head or heel ropes, or both. Besides this objection, they split by driving, and are seldom driven in far enough, and in both cases are often known to hurt horses. After heavy rain on the march, where there was no picketting rope, we have seen a stampede of a whole battery's horses.

The picket line would have obviated this, and there is no safer mode of securing lines of horses than by laying down, and tightly stretching, front and rear picketting lines, and fastening them down firmly at regular, but not too long, intervals. To these, head and heel ropes can be securely and rapidly attached, and as speedily set at liberty. They have the advantage of yielding to a horse's movements, and there would be no possibility of a stampede, though the picket ropes' pegs were drawn. Tethering, to be practical, must apply to individual horses as well as to numbers.

In the case of want of space or of rope, horses can be picketted face to face on a single line. A little more interval would be necessary, and each horse must be kept well back by the heel ropes, and the head-rope must not be left very long. This mode, which preserves, as it were, a balance of power, is only advisable as a temporary measure, as a makeshift; it would not be a wise sanitary arrangement; besides, a central division or passage is useful in a dozen ways. Though tying points in permanent stables should be fixtures, we strongly recommend the use of picket lines instead of pegs.

A picket line should be made of the best hemp, four stranded, well, but not too tightly, twisted, from $1\frac{1}{2}$ to 2 inches in diameter, *tarred*, and interstranded with slips of red cloth to ensure regularity. Secure it with iron pegs, strong and long, having eyes at the top through which to reeve the rope. A small tackle is a handy instrument to tighten picket ropes.

CHAINS.

Both head and heel, should be entirely abolished, not only for troop horses, but for mules, as being too heavy, more hurtful, and more liable, from their sheer weight, to twist round a limb, and less amenable to tying and untying than rope; they either jam tightly or easily get loosened; require extra carriage on the march, and breakages call for skilled workmen to repair them, whilst the syce can repair a rope.

HEAD AND HEEL ROPES.

Should be of hemp, or cotton, which is said to have the preference and not too tightly twisted. A plain strap and buckle should attach the rope to the head, stall, or collar: it is far preferable to a hook and thong, twisted hook, or the notched iron link.

Fore foot fastening by a strap 12 or 16 inches long is advisable where a horse slips his head stall or neck strap habitually. He soon becomes accustomed to it, may pull at it at first but finds he has very little power, either to break the strap or to draw the peg or other fixture. The plan is a secure one, but it limits a horse's movements too much in stables and in camp. The plan is useful when you are on the "Cabul Scale" of weights.

Picketting to a large loose ring which can slide up and down a post, 6 feet high, and round which a horse can move freely unfettered by heel-ropes, is a good plan, but inadmissible in troop stables. Heel-ropes should be fastened to a point about 12 feet behind the horse, bifurcating some four feet six inches from the shackle or hopple, and reduced to two feet if he has kicking propensities. It is safer to fasten both heels, because so many cases of fractured hips have been traced to the use of single heel-ropes. It is not uncommon for a horse to persist in kicking violently upwards when startled, or when vindictive towards a neighbour, until freed by drawing the peg. With double heel-ropes, he is compelled to kick evenly, if he kicks bodily upward, and no harm ensues, excepting, perhaps, sprain to the hocks or fetlocks, but with single ones, he gets half twisted or turned in his stall, and, checked by the rope on the fettered leg, he is brought heavily over sideways on to the large prominences of the femur (thigh bone) the head of which is invariably forced through the pelvic socket, smashing the three bones which form one side of the hip into small pieces, the result being that the horse has to be shot.

Heel-ropes should terminate in soft leather loops, large enough to slip the foot through, and which, when tied behind the heel by an attached leather thong, is prevented from coming off; or the loop may be permanently secured near the rope on itself on the outside by its button and loop.

The leather should be from one, to one and a half inches wide, and folded flat with the seam outside: in this way the edges will be rounded. It must be kept pliant with an occasional application of grease, and requires no lining with numbda or felt.

A band of thick double leather, holding a hook at one end to slip into a notched link at the other, is too wide, stiff, heavy and clumsy, and often a source of injury from chafing. Where the heel or coronet becomes chafed, the loop, *pro tem.* may be fastened above the fetlock.

HEAD-STALLS.

Should be made with moveable brow bands to which eye-fringes, of cotton, leather or hempen string, are attached. They fasten by moveable throat straps passing through a loop on the poll strap and upper ring of the under jaw-strap, to the lower ring of which the head-rope

WATERING BRIDLES.

them clean and free from rust, to remove the
ear in the soft iron of the mouth-piece. In
~~the mouth-piece they become~~

Should be of gut or iron wire galvanised.

The fitting of saddles, bridles, harness and gear of sorts, does not exactly fall within the precincts of this paper, though it is to the Veterinary Surgeon's advantage, and the horse's comfort and service-

ableness, to point out errors relating to the same, with a view to averting trouble on the one hand, and a variety of accidents on the other.

Though somewhat out of place at this stage of my paper, I am induced to add a few remarks on the subject of stable flooring which ought to have been inserted before. And I am further urged to this action because the Government of India is now seriously considering what would be the best kind of stables to build, to prevent the extensive outbreaks of diseases that are not unfrequently occurring amongst our troop horses.

The floors and shoeing shed floors in this station have lately been covered with a six-inch layer of kunkur and coal tar, which, there is reason to believe, will be durable in these particular situations. And as a stable flooring, I think it would be almost, if not entirely, impermeable to moisture if the kunkur were ground as fine as gravel, and had a proportion of cement mixed with it and the tar. The remarks are, however, theoretical. Such flooring should not be less than nine inches deep, and must be laid on well rammed and settled earth, or more compact material, to prevent its sinking under weight, and becoming uneven and undulating. Of course it would require a proper slope towards cemented reservoirs (one to two stalls) to catch the urine, which should be removed therefrom twice daily or oftener. They could easily be kept clean, and the flooring could be satisfactorily flushed. It would require a considerable time to "set" this depth of soft material, and a good deal of rolling: otherwise, if weight were imposed upon it too early, impressions made by horse's feet could not be effaced, and would hold any fluid falling into them.

CONDITION AND EXERCISE.

Troop horses stand more in need to be in readiness for any demand on their energies than any other large collection of horses. Like the soldier's life, theirs should be brought to, and maintained in, a state of 'ever-ready'—without taxing the system or keeping it up to concert pitch,—by regular exercise and training in their own particular work, as they are liable to be suddenly called upon to perform severe and prolonged exertion.

This has been well exemplified during the two recent Afghan campaigns.

Fortunately, perhaps, such opportunities are rarely afforded to test the state and condition of troop horses, but a few forced marches (at the time these notes were penned, *viz.*, 15th July) with the usual concomitants of discomfort, neglect, inexperience, irregularity in feeding and probably a scarcity of food and water, both of an inferior quality, would reduce the greater number of our Indian troop horses, so engaged, to little better than embarrassing if not immovable impediments. Suffici-

ent attention is not paid to the character and quantity of exercise between the end of one, and the beginning of another drill season.

A week of what may be called sharp work in any part of the hot weather, and even in October, would very much distress any cavalry regiment or battery of artillery, owing to the absence of that state of the organism we term "condition." Of course, a line must be drawn between the condition of troop horses and that of race horses and hunters, or our meaning may not be correctly interpreted. There are degrees of condition, and so marked is the difference that a trooper would be said to be in good working condition, whilst a race horse, presenting identical appearances, would be decidedly out of it.

Condition is cumulative and brought about by *exercise*, that is, work properly directed; and judicious feeding. Troopers in fair working condition at this season (15th July) should have a lively and fresh appearance, a bright sharp eye, a skin that satisfies the sight and touch, that is, looks well and handles well, a short fine glossy coat, muscles firm, prominent, and resisting, spirits hilarious and elastic, respiration free and undistressed by exertion fairly prolonged; the body must not, therefore, be burdened with fat, and the depurative functions must be regular and natural. I may be excused for quoting a few pertinent observations on the management of horses by Mr. C. Hunting, an eminent Veterinary Surgeon in the north of England. He says, "Work must be proportioned to the strength and ability of the horse," but we too frequently, in the Army of India, see that strength and ability and general form are *ill-proportioned* to the work required. "It is evident that a horse only half worked is not an economic machine, and becomes a source of loss when overworked, because the deterioration of the animal is then in excess of the value of his labour. By work the muscular system is fully developed, by food this state is sustained, and when it reaches its maximum—when the muscles are firmest, when the blood is richest, when every vital organ is most active—we arrive at the point when an animal is capable of doing the greatest amount of work. This state is 'condition,' and so long as economy is the chief object, all working horses should be kept at this standard. Above it we cannot go, (with impunity) below it, we must not go (but we often do.) Underfed and overwork an animal, and he is at once reduced below the point at which he is most powerful, and therefore most economical. The loss and injury caused by overwork does not commonly show itself immediately and suddenly in a form to be detected by a novice: it is the gradual loss of tone and strength, which entails more food, *but no equivalent of work*, and which gradually, but surely, shortens the life and destroys the value of a horse." The troop horse is often overworked and often underworked from want of special knowledge of the animal, and this is neither surprising nor altogether avoidable, and troopers, at the period before mentioned, are, as a rule "looking well," and thus they are likely to continue, and will satisfy the most fastidious inspecting eye, so far as appearance goes, until the end of October, and so long as they

are only moved or manœuvred occasionally, and then, by fits and starts. But this effect of an apparently excellent management would resolve itself into real impotency under a few successive marches, if a little forced and heavy, under full kits. There would result an astounding number of casualties due to physical unfitness (that want of work engenders) under sustained exertion. An unprepared or "soft" state of the system, is, in such cases, certain to be followed by chafed and galled shoulders, withers, backs and loins, and injuries by the contact of the sword, shoe pockets, carbine bucket, collar, breast-plate, girth, trace and breeching. There would be falls, broken knees, cutting and brushing, (the shoes and shoeing unnecessarily blamed); whilst other cases, of a delicate constitution or physique, would the earlier be "off their feed," and suffer from, if not succumb to, premature fatigue, colic and fever, and lose not only their obesity, but the moiety of muscular tonicity they might possess at starting, requiring quite six months comparative rest and care to bring them round again.

This sort of thing invariably occurs, though, perhaps, less markedly at the beginning of the drill season, if the work or exercise has not been previously and judiciously increased. One of the objects of route marching, which must be of a steady nature, should materially assist in bringing up condition, and preparing the system to stand successfully against the greater trials of constant drill or marching. Long and smart field days at the beginning of the season, where gradual preparation has been neglected, will often provide the Veterinary Surgeon with extra work, and the casting committee with subjects for rejection from premature unserviceableness. If troop horses have been *fairly treated and well managed* during the usual drill season, they ought to look and feel fitter on the 15th of October than on the 15th of April, that is, at the close of regular drills, camps of exercise, and marching in peace time. There are however, many circumstances, unavoidable or uncontrollable, that militate against so desirable a result, and for which allowances must be made.

Marching—but not always at a walk, as some would insist on—is admirable training for troop horses, but experience and supervision should be its inseparable attendants. Pace requires regulating by the general and individual condition at starting; the distance to be travelled the length of marches, the character of the road, climate, weather, season of the year and the changes likely to occur in them, by the nature of the work on hand, by the weight to be carried or drawn, by the strength and adaptability of the troop horse to the work required of him and by the scarcity or abundance and quality of forage.

And it is important to discern when horses are jaded or stale, and when rest is desirable. Of course, there is little choice where ordered to be at such a place at such a time, but even here, experience, and a special knowledge of the powers and capabilities of the locomotive agency, will decidedly triumph over hap-hazard command.

This brings us to the closer consideration of actual exercise, a term implying *active* exertion taken or given to develop and maintain a state of health and condition by which troop horses can execute their military duties and work without premature fatigue, with comfort to themselves, their riders, and drivers, and which, when carried further than their ordinary services dictate, brings out the physique of horses to perfection, enabling them to perform and sustain severe and rapid labour and feats of endurance. Grooming is the only useful *passive* exercise that horses can derive any service from, and this subject will hereafter receive its full consideration.

Exercise as applied to troop horses is usually employed in its narrower sense, merely expressing action at a regular and slow pace, and for a very limited period; for instance "watering order" which, in the hot season, usually commences at daybreak and terminates one and a half hours after. At most six miles—probably the exception—will be got over, and unless those in charge are alert, the character of the pace will be slovenly. Excepting a few horses required for some particular duty, or for riding school purposes morning and evening, and not counting a walk of a few yards three or four times a day to water, the rest of the trooper's life is spent in the stables or lines, and he is said to be kept in exercise!

It scarcely suffices to keep his limbs from swelling.

If the early part of the summer be cool, there may be a few field-days, or Commanding Officer's or Adjutant's drills, but these drop off as soon as sickness, light duty, and removal to sanatoria, have reduced the number of effective men, and when enervation has moderated the zeal of most commandants. With but little change this stereotyped exercise continues till about the middle of October. A gradual increase in its duration, variation of its pace, or the site on which it is taken should be thought of and adopted earlier than is customary, or we lose the opportunity of slowly but surely lessening fatty accumulations of the body generally, disburdening the heart and respiratory organs, reducing the volume of the abdomen and its viscera, developing the muscles, and—this is most important—hardening, so to speak, the skin that must soon bear rougher usage from the chafing and pressure of harness and saddlery.

During these long six months of idleness and *ennui*, there has probably been neither change nor reduction, of any moment, in the food; and *presuming* the regulated allowances are sufficient for the cold and working season, we must naturally conclude that the horses are getting too much food during the hot and lazy season, consequently there must either be a waste of food now, or the cold weather feeding is insufficient: we hold the former opinion, though both cases may furnish individual examples.

Hunting remarks, "Good food must accompany good work; neither must be disproportionate. What is excess of work for one horse is not for another. What is excess of food for one horse may be not enough for another." And more to the point. "The food required by a horse doing moderate work is insufficient for the same horse doing hard work." But on a large scale, too much time and supervision would be required to proportion the food to the work in individual cases. It might, however, be managed. At the same time, the system of feeding in its entirety must be a general one in the case of troop horses, to be considered practical. And the same argument applies with equal significance to exercise and work.

With the advent of October come very perceptible climatic changes and thermal variation; high temperature during the day, invigorating mornings and evenings, with a degree of cold that makes a blanket necessary. Activity breaks out in all military operations, in anticipation of inspections, marching, and camps of exercise, as well for general instruction and special training. And thus the troop horse enters upon increased labour inadequately prepared—at a disadvantage. A tax is thrown too suddenly on all organs previously weakened by idleness and heat, and perhaps, over-feeding. Profuse perspiration follows, and the skin easily chafes and galls; condition, no, obesity, subsides, and harness and saddlery cease to fit in consequence; the weaker animals rapidly fall away, and their systems become so damaged that the normal strength and tone may not be recovered for months, and these bodily exhaustions render them prone to disease, to sprains, falls, cutting and brushing, and the like.

The digestive organs fail in the performance of their functions; an overdraught of water rapidly swallowed, a feed of grain hastily bolted, induces colic; fatigue, partially and temporarily paralysing muscular fibre, of one or both orders of the bladder and its sphincter, results in retention of urine, whilst constipation, impaction, and colic, often supervene on that condition of the muscular tissue of the intestines.

Nutrition suffers by want of exercise; organs lessen in size and activity, and become abnormal; over-exertion produces similar conditions; but the happy medium, where work is proportioned to the quantity and quality of food received, to the constitution and climate, secures that state of the animal body which is capable of sustaining the greatest amount of work, and resisting causes inimical to health, soundness and serviceability.

Every organ has its special stimulus which excites its action, and if this stimulus is perfectly normal in character and amount, and exercise being neither insufficient nor excessive, perfect health and condition are necessarily the results.

Troop horses, then, in India, do not get enough exercise out of the drill season. Certainly, we enjoin rest, or rather relaxation after the

winter's work, but from the 15th July (particularly where the monsoons prevail) they should have not less than two hours' daily exercise, increased to three and over by the middle of October. At any rate from ten to twelve miles should be daily got over (Sunday excepted) if the weather be not unfavorable as regards rain. Walking exercise should be smart, trotting, when advisable, steady and slow, and these alternating with "light marching order," and light manœuvring, will constitute the usual means to condition troopers. And if one's personal experiences are not delusive, the British horse soldier would be none the worse in health and physique for a little more exercise than he voluntarily indulges in, in the hot weather, though not very advisable during his first season. Farriers, shoeing smiths, and rough riders are the hardest worked men in a regiment.

Inactivity is a great error in India, but times should be selected for the taking of exercise, and the sun avoided as much as possible by both men and horses. There will of course be some difficulty in giving as much as three hours' exercise to the troop horses, on account of the present system of nursing and caring for the men. It is only our duty to note what we think is best, and leave the arrangement thereof to others. I see no objection whatever, to robbing the evening stable hour of thirty minutes, and substituting two or two and a half miles smart walking, after which half an hour's brisk strapping would do the horses more good than a whole hour's careless, indifferent, listless, and *pseudo* labour, into which the grooming of the syce and soldier (in India,) degenerates.

Experience, drawn from the close observance of horses training for the turf, demonstrates that about four hours' fast walking exercise daily (twice) is essential, unless other, faster, and stronger, work is being given, to maintain health and promote condition, on a liberal allowance of food. By making this sort of comparison, we do not wish to be misunderstood. The trooper differs vastly from the race horse; does not require, and would not stand, the same training. His class, however, ought to look better than it often does, on the food and under the care it is supposed to get; at least, there ought not to be that unaccountable (?) difference between the horses of one troop or battery, and those of another, living or believed to be living, under the same regime, and in the same station. Where this dissimilarity exists, and it is often seen and often heard of, rest assured defective stable management has been and is at the root of it, unnoticeable or hidden though it may be.

If it is the result of regular work or judicious exercise it is preferable to see troop horses "lighter" at the end of the hot season than is usual, and by this is meant less fat, and with more muscular tonicity and altogether in firmer working trim.

Remounts join from the dépôts at from four and a half to seven years old, and are as a rule in fair order or condition, or developed, if

they have been there any length of time, by liberal feeding and self-taken exercise in the paddocks. Some, however, are over burdened with fat, which is a poor material to begin training upon in the riding school.

If they join at the beginning of the cold season—and have not suffered by the marching—their training can generally commence at once, and proceed uninterruptedly, barring accident, to completion. But if they join at the close of the cold season, their training must be closely watched by the Veterinary Surgeon, lest the Riding School Establishment should, in its anxiety to finish their education, overlook the fact that remounts are the very horses least able, at this time, to bear the chafing of accoutrements, the superimposed weight, and draught, or any exercise which, though not severe, may be comparatively straining or constraining on an animal hitherto accustomed to move and gallop about freely, unweighted and unconstrained. Stud bred will bear the exercise in training better than walers, which easily sicken from extra exertion and exposure to the sun, and suffer from fever with hepatic complications. Lasting debility is a frequent result of this fever, and it is astonishing how rapidly some will fall away under its influence.

The exercise, or rather the training work, of young Australian horses, must be conducted with judgment, and its amount and character stopped, reduced, or altered, where weakness, loss of condition, liveliness, and general health, are observed. They cannot stand much work during the first summer in India, in fact, though they may have been in the country a year, they are still unacclimatised. The coarser breeds—the usual article in the army—do not stand either the work or climate as well as the finer breed of horses. They require much care and warmth during the first winter, more especially in camp and when marching.

The training exercise of remounts must not be carried to a fatiguing extent, or the results will be “brushing,” “cutting” and falls, which not only disfigure the horses, but delay and throw them back in their work.

Exercising on small circles is objectionable, as it is cramping to the action of the limbs. Exercising always on the same ground is jading.

Mounted exercise should often be given to the troopers independently, to keep up the habit that they acquired or should have acquired during their school days, of leaving the ranks at once, when called upon to proceed alone.

All exercise under a trot should be at a fast walk; the horses to be fairly in hand; the men riding at easy attention. The effect of “lolling” in the saddle is well recognised. The route should frequently be changed and the pace occasionally. The Ordinary exercise in the hot season should always commence at, if not before, daybreak—this being

the coolest period. Without encroaching upon the subject of winter drills, it is the Veterinary Surgeon's duty to mark their effects upon the horses, and offer timely advice whenever he sees it required.

Syces should never be allowed to ride horses to and from from watering order, or on any exercise, or on the march, without the interposition of a numbda or folded blanket between the points of contact, for the syce's stern is a well-known source of injury to the horses' backs. Badly stuffed pads on the body rollers, when put on too tight, have the same injurious effect on the horses' spines. There is a practice in the artillery of allowing syces to ride troop horses, saddled or not, on orderly duty, and they may frequently be seen pounding along the middle of metalled roads, in Gilpin-like fashion.

This is neither work nor exercise, and should be discountenanced.

GROOMING.

It is scarcely needful to adduce argument to prove that grooming is necessary: everybody will admit it to be a most essential part of stable management; inseparable from cleanliness and healthy existence under domestication, and indispensable to the wellbeing of troop or other horses.

The nature of their domestication, the nutritious character of their feeding, and their work, pre-eminently demand that grooming shall be perfectly performed. Its neglect total, or partial, is very soon recognised, by accumulations of the desquamatory and other products of the cutaneous secretions, which, if not regularly and frequently removed, check the action of the glands of the skin, and indirectly affect organs vicarious to it, predisposing it to parasitic and other diseases. There will be an unthrifty appearance, the coat will be dull, dirty, long and fast when it ought to be shedding. When the animal becomes warm from work and freely perspires, the cutaneous odours will be very disagreeable; the skin becomes irritable, and disfigurement ensues from rubbing. Proper grooming promotes health, it is invigorating and the horse enjoys it as much as his master does his "tub." It is more important in India than in temperate climates, for the action of the skin cannot be checked for a moment with impunity. On the contrary, the activity, and completeness of its function should be encouraged; it being the most important emunctory of the body, at any rate in the hot season. From his knowledge of the anatomical structure and physiological function of the skin, the professional man sees the important necessity for dermal cleanliness, whilst the amateur comes to the same conclusion regardless of these reasons, but quite aware from custom and observation that grooming and cleanliness must ever precede and accompany health. If the matter be left entirely in the hands of the men and syces grooming will not be properly done; much supervision is imperative, and must never be relaxed during the stable hour. Laxity in grooming, and inattention to the feet (frogs in particular) on the

part of those performing, and those set to superintend it, ought seldom to go unpunished. I speak neither rashly nor unadvisedly, because it is the bounden duty of those concerned to do it, or see it done well, and each should be taught to regard his duty as his "bread and butter."

Instruction in grooming to recruits should be reduced to a system, as almost all acts of manual labour are in the service. Many times have I seen recruits sent to groom animals they scarcely know by sight, and, verily, without kits: they neither know how to go about a horse, nor how to handle him, yet their escapes from accidents are marvellous. Non-Commissioned officers might take more pains to teach the recruit a duty which is with difficulty picked up accidentally and unassisted: judging from the very loose and careless manner in which they *inspect* and *pass* horses brought before them as "groomed," I am quite satisfied that but few understand the art theoretically or practically: this is neither severe nor exaggerative. It is a fact applying to all branches of our mounted army. Old soldiers and syces, naturally, take advantage of the ignorance or neglect of their immediate superiors.

The necessity for grooming increases as work becomes harder, faster, or more protracted, as the quantity and quality of food increase, and as the climate becomes more tropical.

Horses in India lose their fine summer coats about October; their winter coats are fairly set by the end of November, and those in their turn, nature, if she has been well assisted by art (grooming), will have removed by the beginning of April, sooner or later, influenced by season, latitude and many other agencies.

Where semi-starvation and general neglect in everything connected with decent stable management have been the order of the day,—I have a gigantic case in point—the old coats will remain fast in patches, that is, in parts which are a little difficult to get at with the brush, and be difficult to remove. As remarked previously, troop horses should commence their exercise and drill as near to the break of day as can be in the hot season, and be groomed on their return, by which arrangement they get the benefit of the coolest part of the day and are cleaned exactly at the time they require it, and when it does them the most good, *viz., after exercise.*

If wanted for an inspection or a drill that is ordered to turn out half an hour after dawn, let them have as much grooming as the time will admit of, but if not required for what may be termed "eye service," let the grooming be subservient to exercise. Such should be the usual morning routine from about the 1st of May to the 30th September, when the nights (and early mornings) will be chilly enough for a light blanket after gun fire. Of course, this is not so in all our military stations. From about the first of November, and earlier in some places when drills and military duties can be carried on much as they are in

England, so far as time is concerned troop horses should not be stripped too early for grooming, if possible not before the sun is well up, and the chilliness is out of the air : indeed at this time, exercise before grooming is the more commendable in India, because our troop stables unlike English ones, are open and shed-like, and the inner and outer temperature almost indetical, cold, chilling and keenly felt by the horses when first unclothed. Again, in England, where the trooper is not clothed, this subject has no weight or influence on the time that grooming should take place. Private owners would do well to put a stop to the system of grooming long before daylight in both the hot and cold season. It may not be generally known that syces compel the grass cutters to clean the stable, to remove the clothing, and to dress the horses almost in the small hours to save themselves labour, and give them an extra sleep. Punish any recurrences after forbidding the practice, which disturbs the horses rest, unsettles and chills, and in other ways harasses him : besides, it prevents the grass cutter going out for grass as early as he should. There is nothing gained either in appearance or condition by stripping the Indian troop horse too early in the morning ; on the contrary. there will be a loss of both. Let the avoidance of the practice be the rule. If it is compulsory to strip him, let the blanket be thrown over him as soon as he is saddled or harnessed, and kept so until the "turn out" sounds. We will now suppose our troopers have come in pretty warm from drill, riding school, or exercise of some sort. It is customary to water them on their way into the stables or lines, and experience proves that this practice is not bad, if we may judge from the comparative absence of colic or other disturbances to the system, after it : but, to be allowed to drink *ad libitum* at this period irrespective of the animal's systemic or physical fatigue, or degree of heat, or of the coldness of the water and atmosphere cannot be considered advisable. A small allowance of water, when the body is heated and fatigued, is refreshing and good ; and a fair, if not a satiating, quantity, under ordinary circumstances is not prejudicial at this time, which is a convenient opportunity to give it. Nevertheless the practice of watering horses when perfectly cool is undoubtedly the safest and best, and this should be arranged not less than fifteen minutes before feeding with grain. When a horse comes in from work or exercise, no time should be lost before the process of grooming commences, and if he is very hot, it will be advisable to leave the saddle on, or otherwise cover the back until it can be attended to. If saturated with perspiration, he should be scraped and dried as quickly as possible, being, at the same time, protected as much as can be, from the influence of cold and draught, which by causing rapid evaporation, is liable to bring about "chills" and fever or more serious affections.

In wet weather a blanket should be thrown lightly over him whilst his extremities are being cleaned and dried. If the legs and feet are wet and muddy, there is no objection to using water to both, so long as immediate and thorough drying be ensured. If this all important point cannot be attained—half measures are useless—use no

water, dry at once, brush clean and well hand rub afterwards. Experience proves that it is unwise to issue orders or make suggestions to the men or syces that call for the exercise of their common sense: they must be made in a form which admits of no deviation, or misconstruction, and therefore it is found expedient in practice to disallow the use of water to the legs and feet. This is to be regretted, because it might often be employed with so much benefit. However, it is better to accept that which is productive of the least evil.

Feet, and frogs especially, if good and sound, are easily maintained so without the aid of water, yet it harms neither the one nor the other when properly used.

Though we are bold enough to assert that bad frogs need not exist in troop stables, there are always some to be found, and water cleanses such the easiest and best, and after drying, prepares the way for the good influence of any medical appliances that may be prescribed.

If there is to be a total absence of bad frogs, the Veterinary Surgeon would be required to live almost entirely in the stables. (I know it from long experience.) Farriers are expected to attend to these signs of bad stable management, which should never be allowed to arise. The man to whom the horse belongs, and his supervising non-commissioned officer, are not held sufficiently responsible, in fact, few of them show by results that they know when a horse's frogs are sound or clean. The condition in which stable floors are usually kept has something to say in this matter.

And if we would not shirk a duty, it is incumbent on us to say that officers, of, or intended for, mounted corps, would find it very much to their advantage to understand the thorough constitution of stable-management, and to possess some idea of the habits and requirements, in domestication and health, of the animal that Government entrusts to their charge, and to be able to recognise, and if need be, to administer to his commoner ailments.

I am sure most young officers, and many old ones, would only be too willing to devote themselves to the acquirement of that useful knowledge which is, or should be, so intimately associated with the pleasures and duties of their private and professional life. Government would do well to institute special courses under competent and well-paid instructors, who would impart more practical information in three months than could be intuitively gleaned in a life-time. A little knowledge here might upset the old adage, we hope, and be less dangerous than the possession of none.

Reverting to our subject; loose fragments of horn and those forming pockets and grooves about the frogs should always be removed, because they hold the dirt and moisture of the stable floor, which

cause destruction of the newly formed horn, but care and discretion must be exercised, and needless cutting avoided; then, by thorough, regular and frequent washing and perfect drying, with the aid of pressure, most diseased frogs can be cured, unassisted by such agents as tar, which is generally plastered in them and on the feet concealing that which requires exposing, and by its adhesive property, retaining sand and dirt. Stockholm tar is a very useful antiseptic remedy, and is proof against moisture, but should be sparingly used by those who have been instructed as to its application. Its lavish and indiscriminate use is to be discountenanced, as it destroys and rots the horn.

The use of cowdung, oleaginous and blacking mixtures, soft soap, grease and tar and other abominations, which by repeated applications form thick layers of filth difficult to remove, should be entirely disallowed. Nothing looks better than a clean natural hoof, if it has not been altered in shape or mutilated by the knife and rasp. Tarry and greasy *compos* are often employed to temporarily conceal the marks of the rasp, which ought never to be seen scored into the enamel of the hoof.

Whether water is or is not used the feet must always be carefully picked out, and all grit and stones removed with a blunt pointed picker. A sharp pointed one roughly used, will easily scratch or cut through moist horn or frogs not well protected by it (horn).

The picker served out to the Dragoon is too short and too curved, and in some feet is entirely useless. The men are in the habit of leaving their pickers in their room; a very casual inspection of the feet shows whether they have been used or not. Every time a man is found without his picker during "stables" he should be provided with another at his own expense.

I have known this to improve the faculty of memory.

There is no objection to a damp cloth being used to the hoof, if it is not plastered with mud, which careful washing the easier removes. If the hoof is scrubbed with mud on it, the protecting enamel becomes destroyed and the hoof injured.

Loose, broken or shifted shoes, lost nails, raised clenches, exfoliating frog or sole horn and broken (hoof) walls, must be duly reported; and be rectified by the shoeing artificers, who should refer to the Veterinary Surgeon what they do not understand, after inspecting the feet (once a day) at the stable hour succeeding exercise or drill. But as this time is the cooler part of the morning in the hot weather, it is better for the farriers to select some other opportunity during the day to make good those defects, so that their work at the forge fires shall cease as early as possible.

It is not proposed to detail every act or course that goes to make the sum total of the art of grooming, but we will give a sketch of it.

A horse should be thoroughly dried by rubbers and wisps before the brush is applied. Scrape, if requisite, first. Hard dirt is best removed with a strong grass-bristled brush,—not supplied to the army. When quite dried the brush should be freely and smartly used to every part of the skin, upwards, downwards, backwards, forwards and circuitously and be applied not only with the strength of the arm, but with the weight of the body thrown on it. A couple of brisk rubs on the cury combs now and then clear the brush of the dandruff, which when collected in it should be *knocked out* on the floor in the *rear* of the horse and *in one place* and, not *blown out* into the air, as is the custom of syces, just where they happen to be standing. The reasons for this are obvious enough.

Damp hand-rubbing assists materially in removing the coat when shedding commences. The ears, eyes, nostrils, muzzle, sheath, dock, &c., should be well and carefully cleaned with a wet sponge. Damp or dry wisping, damp or dry cloth, glove, wash leather or bare arm friction, are admirable adjuncts after the skin is thoroughly cleaned in restoring tone after fatigue, promoting health, and producing a glossy, sleek, and even coat.

Hand and arm shampooing have a very beneficial effect on the horse's skin and coat, but it is a speciality of the Indian syce only.

The head, mane, and tail are usually the last parts groomed, and they require more time bestowed upon them than is the rule.

Hand-rubbing of the legs is a good *finale* so long as it is not continued whilst the horse is eating his grain. This is a plan adopted by some, and it is by no means a commendable one, because then a horse ought to be left as quiet as possible, for very little excites him at feeding time, and invites the habit of "bolting" or wasting his grain.

Hand-rubbing is especially useful where there is a tendency to oedematous swelling of the legs, or puffiness of the joints; bandages too, carefully and evenly applied, serve a similar end.

Manes and tails should be well brushed from the hair roots, lock by lock, from below upwards, and finished off by good general downward brushing. The long hairs of the ears, jaws, and heels can be occasionally pulled out, and if by one's or two's, the process of depilation is not cruel, and their removal adds very much to the appearance of the coarser bred trooper who in no way suffers by the loss. Eyelashes, whiskers, and feelers should not be cut or plucked out, and mane combs never allowed.

Every troop horse's penis should be withdrawn once a week in the hot weather, and twice a month in the cold, and with the sheath, well washed, with soap, and water, which will prevent flies attacking these

parts, and by removing the preputial and glandular secretions and concretions, will reduce the cases of retention of urine. An ordinary grooming kit should consist of an oval-shaped hog bristled brush, curry comb (which must never be used to the horse's skin, for its purpose is to clean the brush only) two large dusters and rubbers, one hoof picker, wash leather, one sponge, a piece of brown soap, a bag to put them in, and a galvanised iron bucket. We should like to include a water and a dirt brush, but the carriage of these things is a great drawback to their adoption. Hay wisps are easily and quickly made and should always lie handy for use, and be neatly and smoothly plaited.

The practice of washing horses all over is not in itself pernicious; on the contrary, at selected times it is undoubtedly refreshing, but must be condemned *in toto* in Indian and other troop stable management because thorough and immediate drying cannot be regarded as certain sequences. Besides, horses do not require washing except to serve some special purpose, and even here, complete arrangements must be made to guard against ill effects, such as "chills," by clothing and rapid friction.

Troop horses should never be washed except such a course is medically necessary.

Halting, as well as grooming, in winds, should be carefully avoided during perspiration, and the syce who attempts to dry his heated or washed charge in the sun, or with the aid of towels or blankets used as punkhas, a frequent dodge in private stables to save trouble—should either be dismissed on the spot, or meet with a tangible reward if it re-occurs after due admonition.

Erythema, or "mud fever," is here unknown, but cracked heels from the same cause are not unfrequent in the winter months.

Troop horses, in England, whose legs are covered with mud, will take little harm if left alone to dry, whilst the men eat their dinners, provided the horses stand out of wind or draught and as they often do return from route marching, &c., at this particular, and I may say unfortunate, time, experience proves that it is better to let the mud dry on, and be brushed off afterwards, than to wash the legs, and leave them wet or only half dried. On such occasions, the horses should be attended to first, and the men's stomachs subsequently. At the beginning of the cold weather the trooper's tails should be neatly cut and squared, but not too short, to give them an air, of smartness and regularity. After this they should not be again cut till the return of October. Of course in the hot season the longer the tail, the better to keep off flies. Short-tailed horses may have a piece of cloth attached to the caudal extremity to act as a fly-flapper in the stable. Horses inclined to rub tails and manes should be prevented by tying them so that they cannot reach any obstacle; thorns may be tied on to the rear pillars.

Shoeing scarcely comes under the domain of these articles ; it is entirely in the hands of the Veterinary Surgeon (and his subordinates) who will see that it is efficiently carried out, by frequent inspections of everything and of everybody connected with the work.

Harness and saddle cleaning are not intrinsic parts of stable management, therefore, beyond observing that too much attention cannot be paid to the fitting of this gear as condition improves or falls away, or as its paddings and stuffings harden and consolidate, we have nothing to say.

CLIPPING.

It will, doubtless, sound somewhat strange to those who have never served in India to hear the practice of clipping troop horses advocated : but it has for some years taken an important standing in stable management, though, until recently, chiefly in private establishments, and in parts where the cold weather is comparatively long and severe. I have for many years adopted it with the best results ; and, long before the practice received either official recommendation or sanction, noted unmistakable benefit accrue where it was put in force amongst the troop horses of a battery of Royal Horse Artillery on the march, in camp and on manœuvre. These horses were picketed in the open during the coldest part of the year for about three months, six weeks of which they passed on the higher and exposed ground about Roorkee (Camp of Exercise, 1873-74). They were not only subjected to unusual cold, but to hard work, irregular feeding, and to early turning out, and late return to lines.

Excepting the legs from knees and hocks downward they were clipped all over about mid-November when the winter coat had fairly set, and, if needful, again towards the end of December or beginning of January, but not much later, so that the new coat would not be interfered with.

It will be found that clipping only once during the season is not sufficient for some horses, notably the coarse and underbred Australian geldings. These, if not twice clipped, look extremely ragged and stubby about the beginning of March. Some of the well-bred geldings from the old studs and many of the mares require no clipping. As with entires all they want is good grooming to improve their appearance and add to their comfort.

The subjects for clipping require selection. Innovations in stable management do not readily take root ; they are often either nipped in the bud without a trial, or choked by that luxuriant and indigenous weed called " dustoor," before a trial can possibly take effect : it is really astonishing that clipping was not adopted in Indian troop stables soon after the invention of the machine which has entirely supplanted the

old-fashioned comb and scissors; the practice was established on the recommendation of Mr. F. F. Collins, P. V S., we believe, several years ago, and must have required long and lucid representation before it was regarded as practically advantageous to the Indian Trooper. Better late than never; its adoption only requires extension to prove its worth. When once the hair of heavy coated horses becomes saturated with perspiration or rain, they are not only difficult to dry, but very liable to take cold when heated by exercise, if left standing uncovered or unattended to.

Excepting the lower half of the legs in the less hairy horses, and a saddle patch on those whose backs have been needlessly and injuriously branded in the studs with the largest of type, they should be clipped all over. To compensate for the loss of their natural clothing, it is advisable to increase the artificial one, though they do not seem to take much harm under the amount usually allowed. They should never be without clothing except for work and grooming. Clipping to many horses is equivalent to about one-fifth of a daily ration of grain. Clipped troop horses seldom perspire profusely; if they do, the skin and short coat dry almost immediately, without labour, and without risk of taking cold, because there is nothing to hold and retain moisture, the evaporation of which produces chilliness. A long thick coat affords no more protection against rain than a short one; its presence is disadvantageous: but in a dry cold atmosphere or wind, it is protective so long as its wearer does not perspire.

The objects in clipping are :—(1st) to place the trooper in a more convenient and comfortable position to accomplish his daily labour; (2nd) to improve his physical condition, and increase his powers of work; (3rd) to reduce his liability to contract certain diseases; (4th) to smarten his appearance; (5th) to lessen the labour of grooming and; to promote cleanliness and thereby health; and (6th) to act as an adjunctive remedy in the treatment of certain affections.

There can be no objections to clipping troopers so long as the clothing is forthcoming when wanted, and herein, its carriage on the march, &c., is implied. About this, in peace time, there is no difficulty: in war time—by far the shorter epoch—clip and clothe, or clothe without clipping: it is purely a matter of adaptation to circumstances. The Affghan expedition should settle the point.

Horses, with long coats returning to their stables or lines late in the evening, (as is the case sometimes in Camps of exercise) heated, and sweating, are placed at a greater disadvantage, and put to more discomfort than the shorn horses which are easily dried and quickly groomed.

I have observed that catarrhal affections are in no way whatever increased by clipping: that it is eminently adapted for anæmic horses which thicken and fill out on the same feeding and under the same clothing.

On the practice of clipping, Professor Williams, F. R. C. V. S., says: "It is a great advantage; horses work better after it, thrive on less food, are less liable to disease, are stronger, healthier and more cheerful, and when sick, recover in a much shorter time."

Singeing does not commend itself: it is far less satisfactory difficult of application in open stables, and dangerous, and altogether less practicable.

CLOTHING.

For about half the year, more or less, in Bengal, the North-West Provinces, Punjab, Oudh and other parts and Presidencies of India it is essential that the horses should be kept warm by clothing, more especially when they are clipped.

Each horse is allowed a pair of blankets or rugs, aggregating when new, about 16 pounds. The black or grey country blanket, 14 feet by 6 feet, makes a very serviceable clothing. By having two blankets, the amount of clothing can be regulated according to temperature and other circumstances. If standing in the open during rain, one rug only should be worn, the other ought to be kept dry to replace the wet one immediately the rain ceases.

When required to protect the spine from solar rays, a folded blanket should extend from shoulder to tail: the more folds the better. We, however, recommend the adoption of the hempen rug—now in common use in England—lined with good country blanketing, large enough to encircle the chest and fasten there by a buckle and strap. If made to fit the withers, back and croup, with deep sides, it will, of course, be warmer and more serviceable than square unfitted clothing, which hangs loosely hollow, and irregularly about the horse. Besides this, one ordinary blanket should be allowed. These would suffice for clipped horses, and a heavy or light covering would be at hand as weather and position indicated. The outer hempen cover, easily supplied by the country, when well and closely made and firmly bound, is very strong and durable. This is the description of article supplied to bullocks and mules, but a better material is desirable. Clothing wants frequent inspection, and should be rejected when thin. Nothing more is required but a broad country-made ROLLER and PAD which should fasten with two straps and buckles. The thong fastening is a bad arrangement, as too great a purchase can be got on the roller, and when put on too lightly often injures the back, besides rendering the horse uncomfortable. The pads seldom accomplish that which they are intended to, *viz.*, to keep the spine clear of pressure: they demand frequent attention, and re-stuffing. It is often necessary to remove both roller and pad to allow the injured backs to recover.

The temperature of the nights in India require watching, and it is the Veterinary Surgeon's duty to suggest what clothing should be

worn or removed. It is the better plan to begin clothing early enough and before the cold weather decidedly declares its presence, and it should be gradually relinquished as the hot weather approaches. Clothing requires frequent brushing and well shaking twice a day, to free it from dirt and dandriff.

BEDDING.

The straw of the cereals being of considerable value as a cattle forage, is, therefore, not employed for bedding purposes. Rice straw is sometimes used by private horse-keepers, and horses do not care to eat it. For troop horses, bedding generally consists of long coarse grass which grows rapidly during the rains, and is brought in by the grass-cutters, but never in sufficient quantities to properly protect the limbs—hocks in particular—and prominent parts from chafing and contusions on the ground. By this, almost every trooper may be seen to be permanently blemished by an elliptically-shaped scar or roughness on the outside of each hock, in a part which, during recumbency, and when the joint is flexed, becomes prominent, but which in the standing posture forms a concavity. Capped elbows and hocks, chafed fetlocks and bruised hips are prevalent where there is a scarcity of bedding. In very dry seasons it cannot be obtained, and even in very favourable seasons, there is not much to be seen about some troop stables: for I can call to mind an instance of over 400 horses that have hardly had a blade of bedding under them for two years: and the result is not so bad as might be expected. There should be a daily issue of at least, six seers per horse, which, if sanctioned, would, no doubt, be readily supplied. At certain seasons bedding is difficult to keep, for the sun dries and renders it very brittle and easily pulverised: the wind, if at all strong, blows it about; and horses consume a good deal. Syces burn it in winter, to warm themselves, and in summer it is made into small heaps with stable refuse, and lit to smoulder to windward of the horses, to assist in keeping off the tormenting attack of flies by its pungent smoke.

After removal every morning, it should be well shook, picked, cleaned, dried, ventilated and placed in thinly-spread squares, well away from the horses and stables. It is not long since we observed that it was the practice of a battery to stack the bedding under the very noses of the horses in the outside lines. On the march, bedding is out of the question. River sand is a comfortable bedding in closed stables in hot weather, but of no use in the open. Besides it allows the urine to percolate too rapidly, and gives it too much time to soak into the flooring proper below. It soon taints and is, on sanitary grounds, objectionable, unless its frequent change could be depended upon.

WATER AND WATERING.

The supply of water must be good abundant and always handy to the horses, though its source ought to be as far away from the

stables and other habitations, as to preclude contamination by soakage, drainage or sewage from their occupants or by the ablutions of the natives, their clothes or other people's; and if it is brought from a distance, it should be free from the same objections: its aqueducts, if they are likely to pass through the neighbourhood of bazaars, villages or cities, should be securely covered and trapped at intervals for ventilation, examinations, cleansing or repairs.

Wells of various depths are the usual, and perhaps the best, sources of drinking water in the plains, if they are protected from surface drainage and subsoil soakage, are deep and lined with cemented masonry. These reservoirs should be kept clear of all dead vegetable and animal matter: the foliage from trees growing over and about should be prevented falling in, for its influence can be no other than pollutive. The more regularly and thoroughly wells are worked the better and purer will the water be. The mouth of a well should always be higher than its margin: and if not naturally so, a coneshaped construction over its mouth (which may be considerably reduced) affords a capital provision against the return of water soiled on its brink, or the inflow of surface washings: with these precautions water must of necessity find its way into the well by percolation, which if deep enough is a filtering and purifying process. Parkes says: "Shallow well water is always to be viewed with suspicions: it is the natural point to which the drainage of a good deal of surrounding lands tends, and heavy rains will often wash many substances into it." Dr. Cameron, of Dublin, cites a case where good and bad water were obtained from different levels in the same well.

The Rivers Pollution Commission give the following table to shew the comparative value of Spring, River and Well water as sources of supply :—

Wholesome	{	1. Spring water	}	Very palatable.
		2. Deep well water		
		3. Upland surface water		
Suspicious	{	4. Stored rain water	}	Moderately palatable.
		5. Surface water from cultivated land		
		6. River water to which sewage gains access		
Dangerous	{	7. Shallow well water	}	Palatable.

Parkes enumerates the general characters of good water to be perfect clearness; freedom from odour or taste; coolness; good aeration, and a certain degree of softness.

There is a considerable difference in the hardness and impurities of waters in different cautions depending upon geological formation which necessarily influences the composition of water resting in, on, or

running through it; and upon substances derived from the source of the water, added during its flow, storage or distribution.

or city.

In the case of well water advantage should be taken of its temperature when fresh drawn. In winter it is warmer, and in summer it is cooler, than the external air, and should be given whilst the difference is perceptible. With rain, tank and aqueduct water this is not so.

Open storage tanks require cleansing, at least monthly; and troughs daily, or their sides soon become green and slimy, due to a

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running through it; and upon substances derived from the source of the water, added during its flow, storage or distribution.

Whether the hard waters of this country are capable of producing, an abnormal influence on the equine-economy, there is a dearth of evidence to show: there is, however, a prejudice against its use in some countries.

In India a great deal of general care is expended upon the supplying of water to the troop horses, both as regards quality, quantity and convenience. Excepting that it is filtered for the soldiers, it is often the same, and but little importance has as yet been practically attached to it as a cause of epizootic outbreaks. Experience has taught us to look in other directions, but at the same time, to not overlook the water supply as a probable disease producer or bearer.

Though unfiltered and to some extent impure with soluble and suspended organic matter, the well waters of the plains are fairly potable, if taken care of. A great amount of impurity is said to collect at the bottom of the syphons which are constructed on each side the roads that water has to pass under from the source to the storage tanks.

Umballa affords a proof of this, and was much commented upon eight years ago, when the water from the Tangra Nuddee well was looked upon suspiciously during an outbreak of anthrax amongst the troop horses and one of fever of a typhoid character amongst the men. When the reservoir syphons are being cleansed care should be taken that the fouled water at this time escapes by side passages, and that it does not run along the aqueducts towards the horse troughs or storage tanks. I have known of some wells, the water of which horses would either refuse, or drink of very sparingly, yet it was without smell, taste, or color, and had no other physical appearances of an objectionable nature. There was a notable case in Lucknow in 1874. They drank freely from a well 200 yards away. Frequent cleansing and regular working did not remove the objection, whatever that might have been.

Tank water, unless it has a constant in and out flow, as well as all stagnant water, should generally be avoided, more especially near Bazaars, Villages, Graveyards. In camp, or on the march, if the horses are watered at a running stream, select a point *above* the camp, village or city.

In the case of well water advantage should be taken of its temperature when fresh drawn. In winter it is warmer, and in summer it is cooler, than the external air, and should be given whilst the difference is perceptible. With rain, tank and aqueduct water this is not so.

Open storage tanks require cleansing, at least monthly; and troughs daily, or their sides soon become green and slimy, due to a

collection of a mixed sediment from the water, and mucus and saliva from the horses' mouths. Cattle, strange horses, and grass cutters' ponies should not be allowed access to the troop horse troughs, which ought not to be built on the margin of the Grand Trunk (as in Peshawur) or any other frequented road. Horse troughs ought never to be built below the level of the ground, though the same may be automatically filled from an aqueduct above it and overflow obviated by a ball cock arrangement.

This plan is not very objectionable in dry weather, but it necessitates an incline down to the trough, against which in wet weather there must always be a pool of water or a puddle, besides such troughs must generally be one-sided, and can only admit a few, whilst the rest are crowding about eager to drink. Horse troughs should rest on the ground or be raised a few inches above the general level, the ground forming a slight slope from them to serve drainage purposes, and keep the feet from getting wet and dirty.

In cold, windy weather, and indeed always, keep horses' legs clear of the water when it is compulsory to drink from streams or tank; neglect of this rule is a prolific source of cracked heels. It is preferable to make arrangements to water from tubs or buckets on the bank. For the same reason, halting after crossing water ought to be avoided.

We devised a plan in Peshawur, where the drinking water was supplied by a stream, for its conveyance along a permanent cemented conduit in front of the horses, so that the supply could either be constant or interrupted and entirely under control. The same channel was also to serve as a manger. Its chief objection was its expense.

There were no other particular difficulties in the way, neither pumping, lifting, nor other labour were required: but it was an innovation.

A plan for the conveyance of water from its source, to and along the permanent lines, and a reservoir for each horse has been previously alluded to. In the absence of the admirable but somewhat difficult practice of keeping a constant supply before the horses, we must have recourse to the old, and only other method of periodical watering

In the cold season and on ordinary occasions, three times per diem is sufficient, but inadequate in the hot season when horses should be watered, at least, four times daily. It is advisable to allow an interval of from ten to fifteen minutes to elapse between watering and feeding. Horses standing as our troopers do to all intents and purposes, in the open, drink very little water in the early morning, indeed refuse it in the cold weather, and show but little avidity for it until after exercise in the hot weather.

At this thirsty season they drink most at the evening (4 to 5) watering which is rather a favourite time for the occurrence of colic. As horses naturally drink more in the hot months so water should be offered to them the more frequently. The fresh or dry condition of the grass, the moistened, soaked, or dry state of the grain, each regulates the amount of water a horse will drink. Whole gram soaked to saturation takes up its own weight of water: hence a horse eating four seers (weighed dry) thus prepared, will, as a matter of course, have taken in eight pounds or one gallon of water, and it is justly argued that he will require that much less by drinking.

If horses are tolerably cool, or better, not very hot, on returning from drill or exercise, there is no harm in allowing a reasonable amount of water, before entering their stables or lines. If very heated it is better delayed till they are cooled and dried. Say in half an hour. Cold water, provided the quantity is limited, will no more hurt a heated horse than will iced water a heated person. Of this latter fact there is hourly experience in India.

When exercise or drills are late, say nine or ten, water before the breakfast feed. Horses are exceedingly eager for water between nine and ten at night in the hot weather, and on occasions it has been found an admirable practice to adopt. A glance at the usual regime shows a degree of inconsistency in the times, and number of times, of watering, which, however, is not of such consequence in the cold as the hot season. Between 8 A.M. and 5 P.M. (*nine hours*) troopers are watered three times. From 5 P.M. to 8 A.M. (*fifteen hours*) they get no water at all. Of course the difference between the day and night temperatures, and the absence of exercise during the night must be considered, at the same time something would be gained if those fifteen hours could be reduced to twelve.

Extra trouble would be entailed by watering late in the hot nights, but if each horse had his own bucket, it could be filled before the close of evening stables, and stand ready to be given at certain time by one or two men (native sentries) per troop. Horses should not be allowed to suffer from thirst; restrict their water and they will soon look tucked up, and lose condition and spirit. "Washy" horses and special cases require restriction.

The giving of the grain feed immediately after watering is looked upon as an unwise proceeding; yet we are not inclined to separate the one from the other by so long an interval as some. Nevertheless it will be advisable to err on the right side, and be guided by the dictates of experience. I recommend that the feed be not given under from 10 to 15 minutes after watering. As a guide for the hot season, from

about the 1st of May, the following table of times for watering and feeding may be accepted as practicable and adaptable—

WATER.		GRAIN.	GRASS.	REMARKS.
A.M.	7 to 7-15 ...	7-30 Reveille* and 12 noon.	Divide	* The whole of the daily grain ration to be divided into four, the first portion of which will be given, half at Reveille and half at 7-30.
A.M.	11-30 to 11-45		into four	
P.M.	4 to 4-15 ...	4-30	equal parts.	
P.M.	7 to 7-15 ...	7-30		

Of course this regime cannot be a permanent one; it will be modified by circumstances and the gradual alterations of season but it gives a line.

FOOD AND FEEDING.

Whether referable to Indian troop horses or not, these are most important subjects in stable management. To the Veterinary Surgeon in particular, they or their effects on the animal economy are a perpetual source of anxiety, because so little alteration or irregularity will induce functional disturbances in the digestive system, which very frequently terminate in organic lesions and death. The dieting of troop horses has been, is, and always will remain, a source of controversy: each method or system has had its own cycle, advocates and supporters; one plan finding favour now, another coming into fashion then; the whole thing often resolving itself, as many others do in the service, into "a matter of opinion."

The adoption of one kind of grain may only depend upon its abundance and cheapness, when compared with the scarcity and dearness of other kinds, and therefore arises from motives of economy, whilst its preparation for feeding purposes may also have been suggested by similar principles with these commendable views, most private horse keepers are fully impressed. The Native Cavalry Corps generally act as if they knew there was a market price to feeding stuffs, and often find it expedient to drop one grain and substitute another for their horses, without any very disastrous results to the condition or appearance of their horses, and with very decided advantages to the sowers, whom I regard in the light of private owners. The *public* horse keeper is not quite so bound down by economic ties, or we should not find him feeding his troopers on the dearest grain used as horse provender. Where one grain is the staple product of the country, he makes a virtue of necessity and uses it, but where one is much cheaper than the other, he prefers to

use the dearer one with no better results than if there had been an admixture of grains, or a total substitution of the cheaper one. Take Umballa, for instance, in the month of March, and you find 619 horses being fed on three quarter grain, and one-fourth bran, each at about 15 seers the rupee, whilst barley was selling at from 3 to 4 seers more per rupee. We quote market, and not contractors' rates.

If gram produces and maintains the maximum amount of physique, health and serviceability, and engenders the minimum amount of disease and fatality, then it may, with justice, be considered the best description of grain for troop horses (if economy has not to be studied) until its high price, compared with other foods, excludes it as a forage grain. This point has not yet been proved, and to judge by the results of experience, it never will be.

In former times, it was possible, and very desirable too, to give a mixture of grains, the proportion being decided by a Quarterly committee attended by a Veterinary Surgeon. For some cause, this scope for reason has been discontinued, and the iron hand of "order" fixes the diet; I am not quite sure, however, whether this influence is universal.

As regards the preparation of gram for feeding, there would appear to be no rigid laws; one corps may be found soaking it whole for from 6 to 14 hours and mixing in the bran a short time before giving it: another splits and simply moistens it and the bran mixed just before feeding time: whilst a third experiments on the above methods, and tries yet another plan, by allowing the split gram to soak for half an hour.

And thus they go on trying this and trying that, and eventually arrive at the safe conclusion that each has its advantages and disadvantages, but the result, in the long run, is the same. This is not quite a correct one, though, and I shall quote again from Hunting for his remarks are very pertinent on the subject of food and feeding, and the outcome of careful observation and experiment.

He says:—"There are three events which render high feeding economical: (1st.) The selection of the cheapest but best; (2nd.) Giving that food in a form most favourable to digestion: and (3rd.) The prevention of waste.

The selection of the cheapest and best food is, of course, a matter to be settled by experiment. I shall ask you to follow me through an outline of the rudiments of feeding, ignorance of which reduces even the most extensive and careful practice to blind rule of thumb.

Long before chemistry and physiology rested upon any definite principles, experience had taught that certain foods possessed special feeding values. These sciences now enable us not only to say which foods are most likely to be useful, in fact they enable us with considerable precision to state the exact comparative value of the various feeding materials.

Food may be defined as a material which, when taken into an animal body, is capable of being changed and fitted to build up or replace the tissues of the body. Chemistry tells us that these tissues consist of nitrogenous, fatty, and saline matters. It also tells us that foods present a similar composition ; so that, if we know the proportion of these constituents in any food, we shall have a fair idea of its feeding value. But chemistry alone is not reliable, as these constituents are not always in a form capable of being digested; and here physiology comes to our aid, telling us what is and what is not digestible, and also showing us how, under certain circumstances, some constituents are more essential than others.

This similarity of composition between animal and vegetable bodies will perhaps be more apparent by a glance at the following tables:—

Composition of Dry Muscle.			Dry Blood.			Dry Vegetables.		
Carbon ...	...	51·893	...	51·965	...	53·46	...	...
Hydrogen...	...	7·590	...	7·330	...	7·13	...	...
Oxygen ...	...	19·127	...	19·115	...	23·37	...	...
Nitrogen ...	...	17·160	...	17·175	...	16·04	...	...
Ash or Salts	...	4·230	...	4·415	...	.....	...	...
<hr/>			<hr/>			<hr/>		
100·000			100·000			100·000		
<hr/>			<hr/>			<hr/>		

This table shows very clearly, from a chemical point of view, how closely animal and vegetable substances resemble each other. The body does not however appropriate the constituents of plants in the elementary form here given. These ultimate elements are in the plant combined in various proximate forms, suitable for the nourishment of the animal. In the following tables we show the comparative composition of animal and vegetable bodies in those more complex forms, and you will notice that again the comparison is very similar:—

PROXIMATE CONSTITUENTS OF

ANIMAL BODIES.

Water.
Nitrogenous Matter—
 Fibrine (flesh)
 Casein (milk)
 Albumen (eggs).
Fatty Matters.
Saline Matters—
 Lime
 Potass
 Soda
 Iron.

VEGETABLE BODIES.

Water.
Nitrogenous Matter—
 Gluten (oats, maize, &c.)
 Legumin (beans, peas, &c.)
Fatty Matters—
Starch, gum, and sugar.
Saline Matters—
 Lime
 Potass
 Soda
 Iron
 } Ash.

We learn from this table that, in addition to water, the constituents of both animal and vegetable substances may be arranged in three great classes.

The *Nitrogenous* matter of the animal body is found under three forms varying to a certain extent in its properties, in accordance with its derivation from flesh, milk, or eggs; but these three forms are similar in composition with each other and with the nitrogenous matter derived from plants, and all or any one of them taken into the body of an animal is capable of supplying all the three varieties. The gluten of oats, barley, and maize, or the legumin of beans, peas, and tares, supplies to the herbivora forms of nitrogenous matter as suitable and as valuable as the flesh, milk, or eggs consumed by the omnivora.

The *Fatty* matters of the body are not derived from the vegetable foods quite so directly as the nitrogenous. We find that animals make large quantities of fat when fed upon vegetables containing but a very small percentage of this article. The explanation of this is, that vegetables, as the table shows, contain ingredients—starch, gum, and sugar—which do not retain their original properties when taken into the animal body. These substances undergo chemical changes which convert the starch and gum into sugar, and finally the sugar into fat.

These two great classes—nitrogenous and fatty matters—which are found in all animal and vegetable bodies, are what principally interest us in relation to horse-feeding. Remember, then, that the flesh or muscle of the horse is derived entirely from the nitrogenous constituents of the food, and as the ultimate use of fat in the body seems to be its consumption for the production of animal heat, we may name this class the heat forming matter.

We may just add that the *Saline* matters of the food directly supply the saline matters of the body, and that they are quite as essential as the other two classes; but they are required in smaller quantities, and they exist in more constant proportion in each article than the other two. Of course, the composition of vegetable foods varies, and it is this variation that constitutes the difference in the feeding value of each article.

The following table gives a fairly correct idea of the constituents of a series of foods :—(*Overleaf.*)

		Water.	Woody Fibre.	Starch, Gum, Sugar, and Fat.	Nitrogenous Matter.	Ash or Saline.
Beans or peas	...	14.5	10.0	46.0	26	3.5
Cooltee	...	12.03	.....	61.58	23.27	3.19
Gram	...	11.39	.....	66.92	22.70	2.60
Barley	...	13.2	13.7	56.8	13	3.3
Oats	...	11.8	20.8	52	12.5	3.0
Maize	...	13.5	5.0	67.8	12.29	1.24
Hay	...	14.0	34.0	43.0	5.0	5.0
Carrots	...	85.7	3.0	9.0	1.5	0.8
			(Gelatine.)			
Flesh	...	47.0	3.0	3.0	20.0	.....

The chief columns to notice here are those showing the proportions of flesh-forming and heat-forming materials, but we must not lose sight of the others, which in some cases considerably affect the value of a food. The large amount of water present in carrots and beef increases the comparative proportions of the other articles, all of which are in a dried state. Again, the column showing the amount of woody fibre is important, as this article is indigestible, and therefore almost useless as food.

The most important point, however, in the table is this, that each substance differs in composition, some containing a large percentage of fatty or starchy matters, others containing a heavier proportion of nitrogenous matter. This theoretically suggests that some foods are most suitable for the production of muscle; others for the production of fat, and experience fully confirms the correctness of this indication. You will notice, however, that in every case the table shows a higher percentage of starchy than nitrogenous matter. This is not because more fat-forming than flesh-forming food is wanted to meet the waste of tissue, but because a very large quantity of fat, starch, and sugar is applied in the body to keeping up the animal heat. It is, to speak popularly, not only required for the renovation of the body, but as fuel for the use of the animal machine. To meet this double demand, we find that the vegetable foods are always richest in these elements, and thus we have another illustration of the eternal fitness of things. No better illustration of the truth of these statements can be found than the practical success of the Banting system. That system, founded upon the above data, clearly proves that foods rich in starch, sugar, or fat, will increase the fat of the body, but not add to the muscular strength; that lean meat does not add to the fat of the body, but does supply the waste of muscle; and we know that lean meat is simply equivalent to the

albuminous or nitrogenous principles found in vegetables. We know, too, that the demand for these different constituents of food differs according to the state of the animal. In very cold climates the rapid loss of animal heat demands an excessive supply of the heat-producing foods: thus the Esquimaux consume enormous quantities of fat. Again, whenever the muscular system of the animal is greatly taxed, we find a demand for the nitrogenous foods. Hunters cannot do their work on hay alone, they require oats and beans to supply the flesh-forming matter. The British soldier and workman has hitherto excelled in physical endurance and muscular power as much on account of his meat diet as his national qualities. The late Mr. Brassey found that when he fed his foreign workmen on the same diet as his British navvies, the work done by the two approached an equality. Previously they had no chance with the Englishman. Flesh, of course, supplies a heavy percentage of nitrogenous matter, but beans and peas supply even a much larger proportion, and their feeding value was well tested in the late Franco-German war, the German soldiers being largely dependent upon peas as an ingredient of their food to meet the waste of muscular tissue. The wonderful endurance of these men is conclusive evidence of the nutritive value of such food. But we need not multiply illustrations. We wish simply to impress the truth of the chemistry of feeding upon our minds, that we may afterwards fully appreciate the different values of feeding materials.

The value of the foregoing table is enhanced when qualified by physiological knowledge, which informs us that woody fibre is indigestible, and, therefore, an excess of it in any food is evidence of at least one disadvantage. It also tells us that a certain bulk of food is necessary to healthy digestion, and that, therefore, we cannot successfully feed entirely on those foods which contain the elements of the body in the most compact form. Further, we are warned against the action of different foods upon the digestive organs: thus linseed, bran, and maize all cause laxness, whilst beans and peas tend to produce constipation.

Some of these articles of provender possess very different properties; some are laxative, others constipative, but by judiciously mixing them we are able to remove both these objections, and produce a most valuable food. To keep horses in health when not hard worked we need no mixtures, we have one grain in which the nutritive elements are so proportionately arranged that it cannot be improved upon; practice has long adopted it. I refer to oats. But to keep hard working horses in condition is a very different thing. Oats alone are not equal to it, nor can any other single grain preserve both health and condition. The fact is, either their chemical constitution or their physiological action is defective, and we must, by mixing different articles, so alter the nutritive value, and so balance the physiological actions as to produce a food which will not derange the functions of the animal, but which will supply all the requirements of the body.

Both chemistry and physiology, then suggest that more than one kind of grain is advisable, if we aim at economy and high condition. But the full economy of mixed feeding is only seen when we consider the money value of the different articles of provender in relation to their nutritive constituents; that is, when we compare the feeding value with the cost of the article. When, then, we understand the chemical, physiological, and monetary value of foods, we are in a position to select the cheapest and best food; or rather, I should say, we are able to select those articles of food which, when mixed in proper proportions, afford the largest amount of feeding material at the smallest possible cost. Thus, and thus only, is the highest feeding compatible with the strictest economy.

If in the feeding of horses cost were of no importance, so long as health and condition were obtained; a large proportion of the advantages of using mixed food would be lost, as unquestionably oats and hay alone are a very good diet for horses not excessively hard worked. Such materials are, however, 30 per cent., sometimes even 50 per cent. dearer than other provender equally valuable for feeding. Not unfrequently when I have been advising the use of the larger quantity of peas, barley, or maize, to the exclusion of a proportionate quantity of oats, I have been met with the remark:—"Well, granted they are cheaper; are they as good food?" "Look at the Scotch; see what strong healthy, muscular men they are, and many of them subsist almost entirely on oatmeal." This argument is easily refuted. In the first place, oats are not all oatmeal. They contain from 30 to 40 per cent. of husk—indigestible material equal in feeding value to chopped straw. For this husk we have to pay at the rate of 500 per cent. more than it is worth as food. In every ton of oats are 7 or 8 cwts. of husk, which cost at the rate of from £8 to £12, whereas they are only worth 20s. per ton—the price given at the manufactories. Secondly, although the Scotch labourers, as a class, are fine, big men, they are decidedly inferior in muscle and "condition" to the pitmen of Durham and Northumberland, who eat daily from 12 to 24 ozs. of flesh food. I believe that in no part of the world is there a class of men equal in muscular tone and condition to the coal-hewers of Northumberland. The "pitheap" of a large colliery, when the men are assembled to go down is a sight worth seeing for many reasons; but none is more striking than the enormous muscular development of limbs, chest, and shoulder displayed by the majority. Change their diet, substituting oatmeal for meat, and we should at once have a diminished output of coal and a reduction in the size and tone of their muscles. To hard-worked men oatmeal is no efficient substitute for beef and mutton, and for hard-working horses oats are inefficient as compared with beans and peas. Experience tells us this most plainly, and science explains it by showing that beans, peas, and tares are almost identical with beef and mutton in the amount of muscle-forming material contained by each, whereas oats contain nearly 50 per cent. less than either of them. Now, in horses or other animals excessively

worked, consumption of muscle is far in excess of the waste of other tissue, and the blood must be supplied by a correspondingly large amount of flesh-forming material. To fulfil this requirement we must give food containing a heavy percentage of nitrogenous material, otherwise the digestive organs will not be able to supply the requisite pabulum to the blood. Beans or beef supply it, oats or potatoes will not, even if we give an extra amount of them, because this entails the consumption of such an immense bulk of material, a large proportion of which is indigestible and non-nitrogenous, that the digestive organs are overpowered and unable to reduce the mass to a state in which all its value may be absorbed. For these reasons, then, we say that the use of oats as a principal article of diet for excessively hard-worked horses is very expensive, if not injurious."

Troop horses may be said to be fairly fed when they get all that is allowed: there are times when they could do with less, but on the whole there is not much to complain of as regards quantity: syces keep up a system of pilfering the grain, which, to obviate, calls for the strictest supervision. No native should be entirely entrusted with the grain store or with the preparation and the giving of the grain, which is part of his own food, and he will have it unless watched. It is the same in private stables.

Rain has detained troopers on the march, and prevented their getting grass for two days. Mounted corps, in cantonments, by buying the standing crops of compounds and church yards, &c., are able to lay by a good store for emergencies; this is commendable though Peter has, first of all, to be robbed, to pay Paul. The grass-cutter's fund which usually consists of fines, &c., is made to bear the burnt.

There are various contrivances to keep up a dry grass heap or two about the lines. Some force the grass-cutters to bring in extra sized loads daily, and the surplus added to a few pounds cut daily from the troopers allowance, soon grows into a stack of respectable size: the former part of the plan is hard on the ponies, whilst the latter is not fair on the horses. Now the grass thus heaped together after being sun dried and shrivelled is certainly not hay, for it undergoes none of those fermenting and heating processes which are so necessary to convert matured grasses into a delicately flavoured dry forage. Besides when over dried, and put together by daily layers, it becomes brittle, tasteless, flavourless, and is always very dusty; and being immature, contains neither flower, seed, nor stem; is little else than leaf, (blade) root and dirt, possessing scarcely any nutritive qualities; and if allowed to stand long, develops into a mound of rubbish, unfit either for forage or bedding. It is a great pity that more use is not made of the Rukh lands over which a committee sits (and acts I suppose) to increase the supply of good grass to the troops.

These lands are supposed to be preserved and conserved, and I believe would yield a very average quality of dry forage if means were taken to cut and harvest it at a proper time; but when brought in now, it is almost too hard and coarse for bedding purposes and totally unfit for food. It is not only allowed to grow to maturity, but long long past that; it sheds its seeds and withers and dies as a standing crop, and the longer it stands after attaining maturity, the worse it becomes by exposure.

Government, or those who are expected to utilize this grass crop, should spare no trouble, and not be afraid of a little initial expense, to convert it into good sound hay before its seeds are shed, all its flowers gone, and its juices dissipated.

Hay making could scarcely be carried to the same perfection as in England, because the grasses come to maturity before the rainy season is sufficiently settled; but very much could be achieved by watching, and taking advantage of breaks in the weather to get it down and together on the spot. And if land be well selected as to quality and drainage, and be subsequently taken care of, hay might be made in India quite as good and satisfactorily as in Ireland, where not less than two millions sterling are annually lost by its negligent methods of hay making. These Rukh lands and their grasses would vastly improve by the sowing of new, and of a variety of, seeds after the ground had undergone a suitable preparation at the hand of an experienced agriculturist. Years ago we suggested the advisability of selecting plots of land within 5 or 6 miles, if possible, of every cantonment for the growth of grass, and of sending out there for storage, till rotted and ready for spreading and harrowing in, the whole of the manure and stable refuse of the troops. This would be a means of returning to the ground something it year by year loses. Land must become impoverished in time if not supplied with manure in some form. And I dare say if the matter were taken seriously in hand, the conveyance of the manure to the said lands could be arranged with but trifling difficulty and expense. In this way—barring drought—a large supply of excellent forage grass could be maintained, and a six months' reserve for the number of horses usually kept in each station ought always to be kept on hand by Government. The coarser grasses or damaged hay could be stacked and issued as bedding. The hill grass is dry, long, coarse and innutritive, and like that used in Bombay is cut too late to be good.

There is another method of storing which has its advantages not only in the character of the outturn, but also in the process of manufacture, which may be described as diametrically opposite to that of hay-making; because the greener the forage is put together, the better is said to be the mass resulting from subsequent fermentation. The process is not a new one, and has long been practiced by the Arabs, although almost unknown to, or rarely practised by, us. It is termed "ENSILAGE." This means storing forage in a fresh condition for future

use. It is reported on good authority that forage gathered while perfectly wet, indeed, during storms of rain, turns out three months after in first rate condition, and quite equal in all respects to that cut in dry weather. It is said, any amount of green forage can be secured, the action of fermentation so softening the hard stalks and ends, that even Guinea Grass will yield to the effect of lactic acid.

In France, the system is admitted to be a great success and if report be true it can be conducted 50 per cent. cheaper in India; for in hot climates generally, there is no necessity for the construction of stone-sided and bottomed pits, as in England and France. Some further evidence, I am satisfied, is wanting to substantiate this assertion: and besides, the destructive or damaging influence of white ants must be considered.

As this TANK STORAGE system is so imperfectly understood, and almost unknown in Great Britain and the colonies, we will describe it in detail:—

“When the French first went to Algeria they experienced great difficulty in securing forage in the dry season, but by bribing some of the chiefs, they learnt the secret of the Arab system of “Ensilage,” or simply burying the green forage in trenches, carefully concealed by replacing the earth, and they soon learnt how to trace them out. M. Goffart, of Chateau, Burtin, Department Loin et Cher, has lately devoted much time to experiments on this method of preserving green food and with great success.”

“He experimented with green maize. The larger of his pits is 26' x 6' x 6', has well-pointed stone wall sides and paved bottom, bonded with cement. A second adjoining it is not walled round, but has, like the one just alluded to, vertical sides, so as to facilitate the pressing down of its contents. The largest pit cost £11 to make, and frequently contains forty tons (over eleven hundred maunds) of green maize, mixed with about one fifth of its weight of rye straw chaff.”

“These pits are worked as follows:—As fast as the fodder falls into them from the steam chaff cutter, it is spread out and firmly trodden down by men. When the pit is full, some salt is sprinkled on the uppermost layer. Then comes a coating of long straw, and finally, a covering of planks well weighted down with logs or stones, not earth, for it filters through to the fodder. For some time after the completion of the above work, the pits need to be carefully examined every day, as owing to the settling down of the fodder, cracks are apt to form in the roof, and these, if not closed, would admit a quantity of air, and injure the fodder by turning it mouldy.”

“The same danger is incurred to some extent when a portion of the provender is taken out for feeding purposes, and on these occasions, the

precaution of covering over the exposed parts again as quickly and completely as possible has to be observed. The cost of the above operations, including reaping and cutting up is estimated not to exceed ten or eleven pence per ton."

This sour keep, to my mind, will be more suitable for cattle than horses. French agriculturists speak highly of its suitability for working oxen. Mr. Sottom, writing from Gers in the South of France, says that during the last five years he has been in the habit of pitting green maize and sorghum, and he now preserves also, and in the same way, red clover, lucerne and sainfoin. Generally speaking, it requires to remain at least 6 weeks in the pit before it is in a fit state for consumption. As the presence of an excess of lactic acid—the acid to which the sharp taste is due—may cause the sour keep to act as a purgative, and even bring on diarrhoea, a certain amount of caution is necessary in feeding with it. The deeper the pit, and the greater the pressure in the forage, the better is the quality. Two no slight advantages, connected with the pitting system, are, the economy of labour, and the comparative independence of weather.

We do not propose this system as adoptable to the use of troop horses, but introduce it as one worthy of the consideration and trial of those in charge of Government farms and cattle studs, and one which might be adopted with benefit by native farmers, who grow immense quantities of the forage stuffs alluded to, and which might be rendered more convertible by softening process of ensilage. In the *Pioneer* some time ago there were a few notes on the subject: I can only suggest a more extensive trial, and regret that the opportunities are not within my own reach.

For further information, I refer to a very useful pamphlet by Mr. T. Christy, Junior, F. L. S., on "Forage. Plants, and their economic conservation by the" "new system of Ensilage."

GRASS.

Forty pounds of fresh grass, if good and free from sand and earth, and the water which is either used to wash it, or to make it weigh heavily, or thirty pounds of the same, well beaten, cleared of earthy and vegetable impurities, and dried in the sun, are quite sufficient for the daily support of 90 per cent. of troop horses, provided, of course, he receives his full ration of grain, plenty of water, and is not overworked.

The description of grass most common on the alluvial surface of India is called DOOB; an excellent forage grass; and as it takes very deep root it will throw up its feathery shoots above comparatively dry and sandy soils, and where other kinds would hold no existence. Even its roots are succulent and nourishing when fresh from under the soil. In Bangalore they speak of two crops of grass and one of roots per

annum. Doob grass spreads rapidly and in every direction with the slightest rain-fall, striking downwards its fibrous roots from every knot that lies contiguous to the surface. Its deep and strong roots resemble underground stem or stalks, whilst the superficial ones are fibrous, like those of most graminæ. It attains a good height, flowers and seeds, and makes a fine class of hay when cut and well harvested at the proper season. In the plains I know of nothing natural corresponding to English herbage: the verdure of the country is chiefly due to this luxuriant forage grass which is a very pretty specimen, sustaining in its nature, and much liked by the herbivora.

There are a great number of other useful grasses, which, when cut and properly preserved, make a splendid mixture of upland-like hay (but *minus* the herbage.)

I append the local names of specimens collected, and most of which may be found growing together with the 'doob' preponderating.

I regret being unable to make anything like a botanical classification; for practical purposes, however, a qualitative one will suffice:—

Edible and Good Grasses.

- | | | |
|----------------------|-----|--|
| 1. Doob. | | |
| 2. Sowāree | ... | } Similar to Doob and often found mixed with the troopers' forage grass. |
| 3. Jergee | ... | |
| 4. Budree | ... | Resembles a meadow foxtail. |
| 5. Agëa | ... | } Sorts of canary grasses. |
| 6. Senwee | ... | |
| 7. Seeook | ... | |
| 8. Jameewa | ... | A kind of meadow fescul. |
| 9. Unjāna | ... | A sort of crested dogstail. |
| 10. Small Phoolerrie | { | A kind of cross between reed-sweet-grass, meadow smooth grass and trembling grass. |
| 11. Large Phoolerrie | | |

Ranker grasses and more suitable for cattle:—

1. Burrl or Burwālia; 2, Khodilee; 3, Motha; 4, Gurrur, 5, Kurmukurrur.

*Rush grasses:—*1, Kāss; 2, Burwee; 3, Koos, Kansa, or Dāb 4, Surput or Phoos is a 'bedding' grass.

Lemon grass (*Andropogus citratus*) is found in some localities but horses do not much care for it.

The flower or head of the Doob grass is often attacked by the epiphyte.

Uredo segetum, which reduces the ear to a black mass of sooty powder.

We must, however, regard the Doob grass as the staple forage grass on this side of India, in the plains. As just remarked it sends downwards and outwards strong stem-like roots as well as its tuft-like fibrous ones, and is in this way very binding to light sandy and alluvial soils. It springs to the surface with very little moisture and flourishes where other specimens die down.

When scarce it is "cheeled" or shaved up with its roots, which are, to some extent, nutritious and digestible in the fresh state; but, when dry and not well masticated have proved dangerous, and caused death by perforating the stomachal and intestinal coats.

In very dry weather it is sought for near water courses, or irrigated places, but care must be observed not to mix it with a rank sort of grass of the drop-wort class with nodulose roots, so very common in wet spots, and said to be very productive of colic? The blade of this rank specimen is often covered with reddish brown spots or streaks, towards the end of May and up to the rains; and when in this condition is said to produce the death of cattle if eaten in any quantity, but after it has been washed by the first fall of rain, it becomes harmless, and can be eaten with impunity, the deleterious agent having been removed or destroyed. A police officer assured me of the truth of this, and sent me specimens, which I examined microscopically, without finding any fungus or other growths. Superstition appears to be at the root of this idea.

For the most part the grass brought in by the grass-cutters is succulent and immature, mixed with a great deal of sand and soil; partly, this is unavoidable, and partly done to make it weigh heavy. If cut in very damp places, there will be from 6 to 10lbs. of mud in 40lbs. of grass, adhering to it. It is sometimes washed by grass-cutters to remove grit and to increase weight. When packed in bundles it then soon turns yellow and becomes sour. Reject this, avoid giving the grass fresh and green except in special cases.

After beating and picking, dry it well in the sun.

Fresh grass is often blamed as a colic producer, and though we are not quite satisfied that such is correct, we have found it expedient to stop its issue, amongst other preventive suggestions, when that disease has been unusually and inexplicably prevalent. The chief thing to avoid, is the giving of grass in quantities over 8 or 10lbs. at one feed, for death has been traced to have arisen from the inordinate distention of the stomach (with grass) bringing about strangulation by pressure upon various organs in general and the larger venous conduits in particular. In one case the stomach and its contents weighed 32 pounds. Allowing 6lbs. for the stomach and a feed of grain, there were at least 26lbs. of grass in it—well masticated it is true—but, the organ was paralysed, and by its enormity in bulk and weight, produced venous congestion, strangulation and death.

The stomach of the horse being small, suggests either feeding in small quantities and comparatively often, in the stable, or the slower process of grazing. Troop horses should not only be *watered* 4 times daily, but *fed* with grass and grain four times a day at least. It will entail a little more trouble and supervision, but will save the life of many a horse.

Now it is well known that horses deprived of a sufficiency of grass or hay, will not only lose condition, and that rounded state of the abdomen, the reverse of "tucked up," but health and spirits, which cannot be re-established under from 4 to 12 months. I have seen it occur where grass has been scarce, coarse, rooty and dirty, also after long marches and camps of exercise, as well as where none of these conditions existed, but where others did that ought not to.

Horses require bulk as well as quality, and an excess of grain will not supply the animal economy with that which should be supplied by fresh or dried grass. The fæces of horses fed on grain and a deficiency of grass becomes terracious, poulaceous, and not unlike stiff porridge or boiled linseed meal, and the stench is unbearable, and more like that arising from the excrement of carnivora. This is a not an unfrequent condition in camps of exercise, where the work has been heavy, the time for feeding limited and the intervals between the grass feed too long.

We are of opinion it would be advisable for Government always to provide an ample grass supply in the neighbourhood of such places and at such times.

This brings us to the consideration of the important question of the GRASS-SUPPLY which at present is not satisfactory.

The system of entertaining grass-cutters with or without ponies must be kept up in most parts to bring in the grass daily required. It works well enough, as a rule, in India where the Ryot does not interfere with the cutter, but in lower India I believe the zemindari people will not allow intruders about their *khets*. The pony system has utterly failed in Affghanistan, the XV Hussars having lost almost all the ponies taken with them *en route* to Kandahar. On ordinary marches in civilized countries, ponies are exceedingly useful, particularly if well fed and cared for (a thing seldom seen) because they cannot only carry forward a certain amount of grass for immediate use at the end of a march, but can also bring on a portion of the line and tethering gear which would not be up early enough with the slower bullock carriage. Unless some provision is made by Regiments and Batteries in seasons of abundance, there are days during the rainy seasons of summer, as well as in winter, when grass-cutters cannot get out, or come in with their loads, and if from want of rain, grass is scarce, it has to be fetched from long distances. At these times troopers will suffer. There ought always to be a permanent supply provided by Government, in every cantonment, at every

serai near encamping grounds as well as in the vicinity of places proposed for camps of exercise; the amount accumulated to be regulated by the propable requirements of these various situations; for instance, the smallest supplies would, as a rule, be collected at serais.

FEEDING AND FOOD.—GRAIN FORAGE.

If our choice were limited to a single kind of grain, oats would certainly be the best, as in England, for troop horses; but in India, they are not a staple grain, and cannot be grown in sufficient quantities to meet the demand. "Experience has proved, and science explains it, that oats contain in better balanced proportions the essential constituents of food, and in a more digestible state than any other kind of grain. But we find that there is a degree of work sometimes exacted from horses (not troopers) which oats are not able to meet, but which can be met by means of well-selected mixtures of grain." We can, however, dispense with the discussion of oats as a grain forage for troopers. Given with crushed gram, or with that and crushed barley, an excellent mixture is furnished, and if *properly prepared* by crushing no better feeding compound can be given to horses that are called upon to accomplish hard and fast work. In a good sample of the Indian grown oat there is about 7 or 8 lbs. per stone of husk. Mixed grain is always the best, because, if one kind only is used, there will be a preponderance of some element which cannot be properly assimilated, if given frequently and in large quantities, whereas a mixture of grains will not only rectify this, but supply elements, which, though differing but little in ultimate composition, may be wanting, and required by the system. Oats alone are used in England, but a proportion of beans would vastly improve the grain food.

We do not agree with the mixture that is given to troopers, irrespective of season and work, in many stations of India, *viz.* $\frac{3}{4}$ gram and $\frac{1}{4}$ bran, more especially where the latter is made up of wheaten bran of an inferior quality, and often containing a third of barley and rice husks, and a variety of filth.

GRAM (*Cicer arietinum*) has been given from time immemorial as a feeding grain prepared in various ways, and has been regarded as very suitable for troop horses. Once it had cheapness to recommend it, now it is one of the dearest grains in the market, and, as before remarked, Government persists in feeding its horses on it, whilst by mixing with barley, and improving the diet thereby a reduction of about 25 per cent would be established. This is a loss to the public purse. Gram alone is very liable to produce and keep up an irritable condition of the bowels, if given over moderation, when the stench from the faeces is abominably offensive. One-third gram and two-thirds barley, *well crushed*, alternating with half gram and half barley, and with two-thirds gram, and one-third barley, are admirable feeding proportions, the one or the other being regulated in its administration by work and season

There is no particular reason (unless that of convenience) to stand perpetually by one rate of proportion. Attention is drawn to the emphasized words "well crushed," as the proper preparation of barley is more important than that of any other grain, except cooltee: nay it is essential.

Gram is a grain that is often badly nurtured during its growth, and is always small and shrivelled where there has been a lack of water. We believe it is frequently harvested when part only is ripe, which may account for greenish immature-looking samples. Such seeds, which undergo some change during storage, harden and turn black, whilst the inside becomes disagreeably bitter, deficient in nutritive properties, and are remarkably difficult to (soak) masticate and digest. Gram is also liable, like most seeds placed under similarly favourable conditions, to the attack of the fungus of the blue and white mould. This does not occur if harvested well and stored properly. It is likewise very subject to the ravages of the weevil (*Calandra granaria* which tunnels and eats the flour, leaving little more than the husk. The remaining portion of the seed does not seem to be affected in taste or character immediately after the attack, but by time and exposure the flour deteriorates. Grain extensively weevil-eaten should be rejected.

Before being accepted for the use of the service, it should be well cleaned of grit, earth and extraneous seeds.

If horses received their ration by measure, a large quantity of weevil eaten grains would affect their allowance, but by weight, there is little or nothing lost.

A handful, when taken up and shaken, soon declares its character, and if hollow betrays itself by the husky rattle: the holes and the weevil are easily seen: the cavity inside an eaten grain is generally larger than the outer puncture and usually contains the grub, and some dusty debris.

Gram not carefully stored during the monsoons undergoes a change which brings small white spots through the husk and on to its surface. They appear like spots of mildew, but are not of that nature when seen under the microscope: in all probability they are nothing but starchy efflorescences. At this time the grain is soft and can easily be cut open with the thumb nail, not so in May and June, when it is difficult to crack it with the teeth. It, like all grains, absorbs moisture, toughens and sounds dull in damp weather: it soaks readily and quickly, and the higher the temperature the faster will it take up water.

A good sample in dry weather should have a sharp clear rattle like that of tiny pebbles and be full and unshrunk, and tolerably regular in size and color; which latter should be of a chocolate or brown shade. Most samples contain a number of paler seeds, varying from that of a

light brown to a pea green. Though shrivelled these grains are not bad, and the color does not prove them to be new seeds.

If diminutive and shrunk they are of little worth being innutritious and indigestible. When dry, it splits sharply in the mill, and when very damp is tough and does not. It should sink at once in water. All floating grains are hollow, or otherwise bad. Some grains alter in composition, become black outside, hard and very bitter tasted. Their appearance can easily be detected, and, though they sink in water, unlike good grain, they fail to soften.

There are various ways of preparing gram for feeding purposes: indeed fashion has its sway in this as in most other things.

No 1. Soaked whole for a number of hours,—a longer time being required to saturate it in cold than in hot weather; it occupies more than double its original space, and weighs as much again.

Two hours are quite sufficient to thoroughly soak it in the hot season, but we often notice that it is steeped for over 12 and 14 hours. Of course this is unnecessary, though not actually injurious so long as the gram is entire. On the contrary split gram turns sour by undergoing acetic fermentation, if steeped for that time, when it is not considered fit for food. If the water is in excess, soaking deprives the gram of a certain amount of nourishment: this water should not be thrown away, but given to the thinner horses.

Though this prolonged soaking renders the gram physically soft it neither makes it squashy to the taste (one is rather surprised at the dryness it conveys) nor does it produce what is termed "soft condition."

No. 2. Split and soaked for an hour before feeding.

No. 3. Split and given in a dry state.

No. 4. Split and moistened just before giving.

It is seldom given whole and dry,—never to troopers in cantonment—and being a very hard grain, it should always be broken finer than mere splitting, unless it is soaked in its entirety.

No. 1. system makes an excellent preparation for rapidly improving the condition of horses that have been reduced by hard work or insufficiency of food, or both. This was particularly exemplified in a large number of horses that once came under my charge. They had been overworked, and received for a long time a short allowance of exceedingly bad and indigestible grass, had been robbed of some of their grain, and not meeting with that care, management and supervision that they should have had, the majority fell away to little more than skeletal, especially those of upwards of 13 years of age.

Here was an instance of systemic debility requiring careful hygienic and dietetic treatment to restore health and condition. Their digestive and assimilative organs failed in performing their functions properly, and they, with every other organ and tissue, suffered more or less in consequence. It was in this class of case that soaked whole gram showed itself so eminently useful and recuperative. It was well prepared for mastication (though *post mortem* examinations show that large quantities are bolted whole) for stomachic and intestinal digestion, and ultimately, for absorption, and thus, in this instance, the soaking increased its adaptability for the operation of a set of organs weakened both structurally and functionally. Though there can be no doubt as to its being a preparation on which horses can live, thrive, and work, we regard it not so much in the light of a natural food, as an artificially alterative one, by which property it aids nature to regain convalescence, health and condition.

As a medical or pathological food, so to speak, it is admirably calculated to bring about those results in debilitated systems, which are afterwards easily maintained by food not so artificially prepared. It is called a "soft food" (when soaked), a term intended to describe its own character physically, as well as to define its ultimate influence, as to condition on an animal. In reality it is soft, but it does not produce soft condition, except under those circumstances which would produce that state no matter what food were given, *viz.* laziness and want of exercise. The gram is only mechanically altered by taking up water, of which horses will naturally drink less than when fed on dry and harder food. Yet the experience of trainers everywhere leads to the general adoption of dry and hard feeding to bring to perfection the highest physical powers of the horse, and we cannot or should not disregard their practices, but follow them as closely as the circumstances in the life and work of troop horses will admit of. I do not wish to condemn the practice of soaking whole gram, but fear the system cannot be regarded as practicable on the march, in camps of exercise, or even on local field days, where gram forage may have to be taken out for the day in as small a bulk and reduced a weight as possible. The details that would be required for carrying out the plan on the above particular occasions can easily be thought out by those likely to be concerned. Out of a station or standing camp, soaking gram is not a practical part of stable management, and therefore where a system of feeding will not meet the emergencies of camp manœuvre or campaign it does not seem to me to be one to advocate, excepting where the special reasons above alluded to exist. Besides sudden changes in the character and preparation of food is found to be not good. In dismissing the discussion of gram, we may deduce, that gram *alone*, no matter how prepared, is not a very suitable grain for troop horses; it is not improved by the addition of an inferior quality of bran, such is as usually furnished by the Commissariat Department: if gram *must* be given alone, let it be well broken up, and simply moistened with water just before feeding and mixed with a little finely chopped hay or grass.

BARLEY.

Like gram this is a staple grain in India, procurable almost everywhere, and used extensively for horse feeding. In some stations it is the only grain obtainable at a reasonable cost, for instance the more northern parts of the Punjab administration, where barley forms the chief portion or whole of the troopers' grain forage and as such it is excellent, provided the sample be good and it is *well crushed*. It should be sound, hard, short, stout, heavy and thinly husked. Damp and mould samples, long thin seeds with a preponderance of husk, must be rejected; and also that adulterated with injurious seeds, sand, mud, and stones. It is not very liable to insectile attack but the blue mould fungus is said to attack its inner coat. Uncrushed, unground raw barley is both difficult to masticate and digest, and in this state has frequently caused immense dietetic disturbance and death; it will pass out undigested to an unsuspected extent. Even when ground by the ordinary "chukki" or stone hand-mill—in the imperfect manner generally seen in Regiments and Batteries—we have practically demonstrated, at much labour, that one seer in five is the average daily waste. Roasting facilitates the grinding and tends to give a more satisfactory digestive result, but it is not always practicable. It is not advisable to give roasted barley unground or uncrushed. Time, trouble, and expense are involved in proportion as preparatory processes increase. We are not in favour of grinding—do not mistake the term—because as usually conducted it only tears some grains into several pieces, and allow a large quantity of whole ones to pass through untouched. If there must result no waste from grinding, great care and supervision are called for. The country hand-mill is too light to do it rapidly and effectually, and unless the grinders are watched they hurry the process and limit the grinding power of the stones by separating their surfaces, by means of a washer of leather, cloth or cotton, fixed round the base of the pivot of the lower stone, or by other methods.

Now barley is highly nutritious, and contains a large amount of nitrogenous (muscle-forming) material, and even when given alone, if of good quality and *well prepared*, is a first class food for Indian troop horses, as well as others. Half gram and half barley is an excellent mixture for cold weather feeding, and two-thirds barley and one-third gram for hot weather. Presuming all are good, the best training food we know of *as the general feed*, consists of one-third each of gram, oats and barley, with an occasional variation in the proportions, each slightly preponderating in turn. They must all be *prepared* by crushing, and this can only be properly accomplished by passing them between the smooth wrought iron wheels of machinery; no other method brings these grains into so thorough and fit a form for feeding purposes. Of course the pressure of the wheels requires regulating for each description of grain; 25 per cent. can be saved by using the machinery alluded to either by steam, horse, bullock, water or hand power. By the slower process of hand power a couple of syces are able to work easily and

satisfactorily a little machine made by Messrs. Turner, Ipswich, and known as their "model corn and seed cursher," No. 11, weighing (box, pedestal and all included) 166 lbs. It packs for transport *into* the box pedestal and fixes *on* to it for use. It will break up (as coarsely or as finely as desired) about six maunds of gram per hour and four or five of barley, with two or three pairs of syces. Barley and oats are crushed into tiny wafers or scales, and being only flattened—not ground—no flour is wasted, and not a single grain escapes uncrushed. The same class of machinery on a larger scale may be more useful and rapid in execution, but certainly not more satisfactory in result, or handy for transport. I have known one of these little machines crush barley and gram for 178 horses daily for over twelve months, so effectual and expeditious was its action and power. Syces, who have a great objection to touch the ordinary mill stones, willingly work these machines, and, as they are most simply constructed, require but little understanding. There is no danger of their getting out of order under ordinary care; there are neither cog-wheels nor ribbed rollers to go wrong. In the crushing of barley they will save nine pies per maund to the battery or troop commander. Thus it will be seen that not only does this kind of machinery quickly pay for itself, but, as it were, increases the daily ration of every horse nearly 2 lbs. Cattle feeders and milk sellers are so well aware of the amount of waste grain that is found in horse (troop) manure (where barley is used) that they either wind-sift the dry droppings or feed their cattle on the fresh ones.

MAIZE.

Is never used for troop horses in India, and seldom for other horses, but it is found to be very fattening when mixed with other grains or given alone in a reduced state. I am certainly very much in favour of mixed grains for horses, but expense and inconvenience preclude their adoption for troopers, except to a limited extent. Maize can be well reduced—a very necessary preparation—by a kibbler attached to the small machine referred to, and which is known as Turner's No. 11 B.

BRAN.

Is one article when pure, and another when issued by the Commissariat of India. It is, however, difficult to procure in the quantities now required for troop horses, *viz.*, $\frac{1}{4}$ of the grain ration, and therefore, we are as much as told to put up with the adulterated stuff tendered. I argue that it is much better to give a substitute that one knows will do a horse good, than to give bran like this which can do him no good but probably harm.

Bran when pure is an excellent alterative food a gentle laxative, incomparable as an adjunct to a low diet, useful in sickness, convalescence, obesity, plethora and inaction, but it is not a fitting food alone, or in the proportion of one-fourth the ration, one-eighth would be preferable, except under special circumstances.

COOLTE, OR KOOLTE.

Like gram, a Leguminosa, is extensively used in Bombay as a horse food, and usually given after the process of boiling : soaking might perhaps suffice to soften it, but either preparation being always necessary to render it edible, reduces its value as a food for troop horses, though it is very rich in nitrogenous principles.

NOTE.

Is possessed of fattening properties, and is much used by native cavalry, as well as by contractors on the postal lines for their dāk horses. For hard and fast work it is not a commendable forage grain, but it is useful to get animals up in flesh.

Carrots, lucerne, guinea grass, green barley just coming into ear, mukki, kirby, cherrie, and the like are very desirable *additions*, not substitutions, to the troopers' food if fair and regular work is being done. We can only advise their substitution where work is very light and slow, and in sickness and convalescence, or as an alterative in health.

The same remarks will also refer to linseed, which with suttoo (gram and barley flour mixed) and oatmeal are very useful articles of diet in the hands of the Veterinary Surgeon. Each Regiment and Battery should keep up a large plot of lucerne or guinea grass; it is easily done, and is exceedingly useful. Salt in quantities, not less than three drachms, should be given daily to each horse. In the hot weather I have found it beneficial to increase it to four, and even more where outbreaks of Loodhiana fever show themselves.

I propose concluding my remarks on "The Stable Management of Indian Troop Horses" and in now bringing the subjects of FOOD and FEEDING to a close cannot express my own views more concisely and emphatically than has Mr. Charles Hunting, who says:

"Economic feeding requires:

- "1. A mixed food.
- "2. That each article of provender be of the best quality.
- "3. That the kind of provender used should depend to a great extent on the relation of its price to its feeding value.
- "4. That the quantity must be regulated by the daily work done.
- "5. That the food must be given in the form most favorable for digestion.
- "6. That the times of feeding should be regular and frequent.
- "7. That these matters should be supplemented by GOOD STABLE MANAGEMENT," of which, we trust, we have rendered a *satisfactory dissertation*.

GRASS CUTTERS' PONIES.

Though we have, in reality, come to the close of our observations on Indian troop stable management paper, it will not be irrelevant to wind up the first section of this essay with a few hints on that very much abused animal—the grass cutters' pony—and his management. And it is almost practically impossible—as matters at present stand on this side of India—for a regiment or battery to move, or march without the aid of this useful class of creature, it is important nay essential, that it should receive more attention in selection, purchase, feeding and general care, than is usually the case. Through their ubiquitous wanderings these ponies are liable to meet with many contagious and infectious influences, and become the conveyors of such to the horses for which they are daily carrying grass forage. Besides they are not unfrequently purchased, unwittingly from pestiferous localities, and are the bearers or hosts of various diseases to which their well known poverty and neglected filthy condition render them particularly susceptible. It would appear that they receive little or no attention from any one, and it is quite the exception to see them anything better than the miserable objects that the very name of "grass-cutters TATS" significantly conveys. Veterinary Surgeons will, however, find it very much to their advantage, as well as to the safety of their legitimate charge, to bestow a portion of their professional care and supervision upon them, and extend the same to their lines and general surroundings, to watch them in health, and to be not too proud to treat them in disease, which with but little surveillance can be easily kept in check, suppressed or cured.

It was our lot—perhaps misfortune—on entering upon a certain charge, to find all the grass-cutters' ponies (one hundred and eighty-five) affected, or in contact with those, the majority, affected with true psoroptic MANGE—a parasitical and contagious relic of a gallant regiment that left India not eleven years ago.

Without exception it was the most pitiable mass of equine life I had ever witnessed. It is true there had been a scarcity of grass; and grain was at famine price: of the former they had only what they could pick up whilst waiting for the collection of their loads in the jungle: how much they got of the latter, who can tell? Setting aside these facts, which mean 'starvation,' it was grievous to see these poor weak, attenuated, semi and wholly depilated objects of ponies rubbing themselves violently on walls and trees, on each other, or on any obstacle in the way, rolling, biting, gnawing and scratching their denuded skins into sores which the crows increased by pecking.

Owing to the extensive ravages of the disease, and to the emaciation partly resulting from it, starvation and hard work, and in consequence of deformity and incurable diseases of limbs and joints, thirty-six were recommended to be destroyed by a professional (Veterinary) Committee.

But no one was found equal to the issue of an order at once so palpably responsible and involving, and thus they lived on a disgrace to an enlightened and humane community, some unable to rise or eat, taking days to die from sheer exhaustion, the crows pecking at their wounds, and digging out their eyes long before death relieved them. It being against the native caste to take away life, and against the pocket of any who would be so audacious—out of pity's sake—to order their destruction, these wretched creatures were not aided by the hand of humanity, as they should have been, to terminate a miserable existence. Would it be credited by any conversant with the contagious character of the disease in question, that it was proposed to sell a number of the worst cases wherever a market could be found, and the proposition was within an ace of being carried out, notwithstanding the strongest Veterinary medical protestations against turning loose such a loathsome disease upon the public and country at large, upon which such a proceeding would have been positively unjust because detrimental to their interests.

It had been foreseen that the application of curative measures, on so gigantic a scale, was a difficulty to start with: and it was fully recognised that the loss of the ponies' services whilst under treatment would have to be provided for, and that their feeding whilst placed in a condition where they were incapacitated from picking up their own living would cost money; that other means were necessary to bring in grass; that immense quantities of medicines would be needed if treatment were adopted; that compensation for the compulsory destruction of every particle of lime and pack gear would be a very natural demand. Besides, it was flattering to none, singly or collectively, that such a state of things should exist, and it was, perhaps, excusable to try to get out of the embarrassing circumstances with as little exposition as possible.

Thus it will be seen that there are numerous reasons why the amateur's diplomatic mind grasped the idea of ridding this large centre of contagion in its worse form. It had the appearance of deciding actively, comprehensively, and masterly, with a difficulty, because a blemish would thus be removed at once from a position in which it is not expected to exist. But eventually, this notion of unlimited dissemination of disease was given up.

The cat could no longer be kept in the bag, and as no private enterprise was forthcoming to defray the cost of all, and as no one would be imprudent enough to kick against the warnings of the Veterinary Medical officer, the only course left open was to cure every pony that possessed sufficient vitality—letting the rest die—and *then* sell or otherwise get rid of those unfitted for work. So Government *had* to be appealed to, and it responded thoroughly and bore the brunt, not only sanctioning the expense of medicines, but allowing each pony one seer of grain per diem, providing camels to bring in the troopers' grass, and compensating the owners for the burning of the ponies' gear.

In recording these facts, my chief object is to point out what may be avoided by care, to show the turn such unwelcome visitations are likely to take, and to prove that a Veterinary Surgeon can save himself an immensity of labour by supervising and treating, where requisite, what is, in truth, the private property of grass-cutters—an establishment neither recognised by Government nor entitled to Veterinary care at all. We would like to recommend to those Veterinary Surgeons, who are new to the country and its ways, and may venture, without fear of offence, to include those who have passed the period of Griffinage, to regard the grass-cutters' ponies as part and parcel of their charge, *at least, for their own, and humanity's sake.*

Not a single pony should be admitted for grass-carrying purposes that has not passed the Veterinary Surgeon's examination, and been declared free from infectious and contagious diseases. To prove the necessity of adopting this course, I have only to instance the tendering of a pony, not very long ago, for service, as a grass cutter, in my own regiment; he was found to be virulently glandered, and traced to have left a district (Saharunpore) which, at that time, was an infected one. The pony was at once destroyed on magisterial authority, and the introduction of a horrible malady was kept out of the regiment. This stitch in time saved many a nine.

As with admissions, all rejections should be supported with veterinary advice. None under 12 hands 2 inches, or under 4 years old, should be passed in, and selections should be more marked for compactness, strength, squareness of body, straightness of limb than is customary, and some attention should be paid to the ponies' adaptability in make and shape, so that their duties as pack and baggage animals may be performed with more comfort and ease.

It is all very fine talking, but what can you expect to get for 20 or 25 rupees?

There can be no objection to 13-2 ponies. The ponies should be inspected (by the Veterinary Surgeon I mean) once a week if possible, and certainly not less than twice a month, and each should bear the letter of its troop or battery, on the off, and its own register number on the near, fore hoof. The left side of the neck should bear the brand of the Regiment, as D. 6 G., or A. C. It is my practice to have each pony's pad and pack gear paraded in front of him, so as to see that it is kept clean, soft, and in repair, and that it fits. After inspecting the ponies by walking in front and rear of them, let them file past slowly, one troop at a time, so as to note condition, cleanliness, and what effect ill-fitting gear may have had on them, and to see whether they are *bond fide* grass-cutters' ponies, bearing the regimental brand. Then let them counter-march at a slow trot, by which lameness is at once discovered. Having now seen them from all points nothing will have escaped notice. Very lean and unfit animals can be withdrawn, and excused work for

a while; wounds chafes and galls can be attended to, and so on. Though there doesn't seem much room for a "double" grass-cutter on Rs. 8 per mensem to provide his pony with a daily ration of grain, each should receive one seer at least and it must be given under European supervision. This duty can never be safely delegated either to the owners or to the chowdries.

The pads and pack gear require frequently beating and cleaning to remove dirt and perspiration, which cause hardening and induce galls and chafes. By "hogging" their manes a cover for filth and vermin is at once and entirely removed, and should be done about once a month. Tails to be left uncut if not trailing, for they are indispensable to animals so much exposed to the attack of flies, etc., Each pony should have an eye-fringe to keep off insects, and to subdue the painful effects of sunlight and heat. Clothe in winter if possible.

Inspect their lines occasionally; allow plenty of superficial space avoid hemming in by native's butts. The ponies being out almost all day, their lines get plenty of ventilation. It is essential, however, that they be regularly cleaned and kept free of fouled earth and faces. Strange ponies not to be admitted here. As a rule grass-cutters' ponies do not require shoeing, but their feet must be occasionally and judiciously rasped to prevent the hoofs running into deformities. Insist on daily grooming, and as a last bit of advice, punish owners caught riding on the top of a loaded pony.

Though I have at some length and trouble endeavoured to show how these most miserable of all animals (excepting the gharry ponies which are to be seen labouring about cantonments—a crying shame) can have their existence rendered more comfortable, I am not in favor of the employment of ponies to bring in grass for troop horses. The experience of the Afghan campaign has shown that they are a mistake in war time, and a regiment or battery would be much better off with "single" grass-cutters—one man to bring in his load of twenty seers daily—than burdened with an establishment that no one cares to look after, and which cannot support itself. Some extra camel carriage would be requisite to carry line gear on the march; it is very hard on the ponies to expect them to carry in a certain amount of grass, and so many horses line gear, and perhaps their owners and families and belongings, and then having finished the march to go off into the jungle for forty seers of grass.

Some of the most torturing pieces of iron in the form of bits or snaffles may be found in use amongst these ponies.

Have them all collected and altered to smooth round plain and hinged snaffles, if possible; and if the owners will not provide comfortable non-torturing ones, make them go without in preference to using barbs, edges and spikes.

I hope the days of grass-cutter ponies' and mules are numbered, and I may further express a hope that CAMELS *may not be universally substituted for them*. I have seen them introduced in one or two places, one camel to five men. Now, considering that when the monsoon rains are tolerably regular, there would be about four months during which camels could not possibly go into the jungle, for it is well known they can scarcely travel in wet weather unloaded, it appears to me to be a bad look out for those horses that happen to be dependent upon camels for their grass.

Besides this insurmountable difficulty, that is, the liability of the camel to split up, by the lateral separation of his legs on wet and slippery ground, I need not now offer further warning, though I have seen that it would be very necessary in other points concerning that animal, if he should unfortunately happen to supersede the pony in this particular duty.

The 1st Section on "Stable Management" is concluded.

UNITED SERVICE INSTITUTION OF INDIA.

NOTICE is here given that the subject of the Essay for the Institution Gold Medal, for this year, is "A Transport Service for Asiatic Warfare."

The terms of competition are :—

1. The Candidates must be Government Gazetted Officers.
2. The Essays must be legibly written, or printed, not exceeding 32 Pages of the Size and Style of the Journal.
3. The Essays must be forwarded to the Secretary on or before the 1st May 1880.
4. The Essays must be strictly anonymous, but each to have a motto, and be accompanied by a sealed envelope with the motto written on the outside and the name of the Candidate inside.
5. The Essays will be submitted for decision to three Referees chosen by the Council.
6. The successful Candidate will be presented with the medal at the Annual Meeting (if he be present), and his Essay will be printed in the Journal.

By order of Council,

A. D. ANDERSON, CAPT. R. A.,

Secretary, United Service Institution of India.

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By order of Council,

A. D. ANDERSON, CAPT., R.A.,

Secretary, United Service Institution of India.

SIMLA, }
31st Decr. 1879. }

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The address book is corrected up to date from the Army Lists, but mistakes are occasionally unavoidable, unless members themselves promptly notify their change of residence.

Members proceeding to England on leave, who wish the Journal to be forwarded to them while absent from India, should inform the Secretary, and send stamps for the postage by Brindisi or Southampton.

When a member appears in orders for leave to England, his Journal is not despatched unless he asks for it, and while absent from India his subscription is not payable unless the Journal is supplied.

Members on return from furlough can obtain the numbers of the Journal that have been published during their absence, by paying the subscription for that period, and all members on returning to India should inform the Secretary of the fact.

The Secretary will be happy to send an Index to volumes I, II, III, IV, V, VI and VII to any member wishing for the same.

A. D. ANDERSON, CAPT., R.A.,
Secretary, United Service Institution of India.

ORIGINAL PAPERS.

I.

KAFRISTAN AND THE KAFIRS.

A LECTURE DELIVERED

BY

SURGEON MAJOR H. W. BELLEW. C. S. I.,

At the United Service Institution.

SIR PRESIDENT, LADIES AND GENTLEMEN.

The subject of my lecture is Kafiristan and the Kafir location, the Southern Slopes of Hindu Kush.

Ever since Elphinstone's Mission to Peshawar in 1809, first made us acquainted with the existence of this country and people, a curious interest has prevailed to learn more about them, and from time to time different travellers and enquirers have given us the benefit of their researches and views regarding both, more especially the people.

A great variety of information regarding them is to be found in the works of Elphinstone, Burnes, Masson, Wood, Mohanlal, and others, as well as in the writings of Leach, Lumsden, Raverty, Leitner, Hughes, and others, and also in the pages of the journal of the Bengal Asiatic Society.

But up to the present time we have no account of this country and its inhabitants by any European traveller who has himself visited them. This deficiency is, however, we may now hope about to be remedied by the voluntary enterprise of an able and energetic Officer who has devoted himself to the enterprise; and we may confidently look forward to the acquisition ere very long of some valuable discoveries and much interesting information regarding this very mysterious country and people and doubtless with many corrections of our present knowledge about them. Let us accord Major Tanner our best wishes for a successful exploration and safe return.

I said just now that we have no account of Kafiristan and the Kafir by any European who has himself visited the country. Nor, so far as I am aware has any native author published a history of them. There are, however, some brief notices of this people and country scattered about in the works of different native historians, and they are of importance as the record of, in several instances at least, actual visitors to the country and actors in the incidents described.

In the "Zafarnáma Tymuri," which is a history of the conquests of the celebrated "Tamerlane," date about the middle of the 14th century it is stated that Tymur in one of his numerous expeditions against Badakhshan, essayed to force his way to Kabul through Kafiristan. His passage over the Hindu Kush was attended with infinite perils, and it was with the greatest difficulty and hardship that he penetrated to the dark recesses of the Farajgal valley in the very heart of the mountains. He was here surrounded by the natives, and so hard pressed by their fierce assaults that he was like to be destroyed with his whole force, so many men did he lose before, with the remnant, he asserted his invincibility.

After a desperate fight in which victory wavered from side to side for many hours, Tymur finally beat off his enemy, and by way of commemorating his victory caused a stone pillar to be erected on the site of the battle. This pillar is said to be still in existence under the name of "Tymur's Tower." A description of this expedition is also found in Farishta's history, and to much the same effect.

In the "Tarikhi Rashidi," which is a history of Kashgharia, dedicated to Sultan Rashid, the last of the Mughol Kings of that country, there is a very interesting account of several expeditions made into Kafiristan by that prince from the side of Kashghar. This book was written a little later than the middle of the 16th century by Mirza Hydar, who was a cousin of the Emperor Bábur, and guardian of the prince after whom he named his history. And he accompanied the Kashghar prince in the several expeditions which he describes, and speaks of as an eyewitness.

The Emperor Babur himself founder of the Mughol Empire in India. In his Memoirs (translated into English by Erskine from the original Turki) gives a very lively account of his conflicts with the Kafir of Bajawar from the side of Kabul, and amongst other things mentions their lively disposition and free use of wine, which they carried about with them in leather bottles called "*khig*," There are some other similar notices of this people in the pages of other native authors, and one or two of them I will refer to later on.

From the information collected and made known by modern and contemporary writers it would appear that the general tendency is to invest the people who inhabit the country now known as Kafiristan with a mystery for which there is no necessity, and to accord them a peculiarity of origin and manners to which they are not justly entitled.

All those who since the time of Elphinstone have written about this people, have done so restricting their enquiry to the narrow limits of the country and people as they now are, without regard to their former history and extent of range. And so they have come to consider them as entirely distinct from their surroundings and neighbours. Whereas it seems to me that both country and people should as I shall

endeavour to show be viewed merely as parts of a former more or less well defined whole.

That is to say, Kafiristan is but a portion of that larger area of similar country with whose systems of mountains, valleys, and rivers it is connected, and with the climate and productions of which it shares a common character. Whilst the Kafirs, are only a portion of the people of that larger country with whom they have a common origin as is evidenced by the similarity of race of characters, manners and customs (notwithstanding the variations effected by change of Government and religion), and as is evidenced also by the cognate character of the many widely different dialects spoken by their numerous tribes. Indeed in these points of divergence from each other these several tribes differ no more widely than do amongst themselves the Celts of Cornwall, Wales, Ireland and Scotland in our own country, and especially even at this day in the different dialects of Gaelic spoken by them.

To understand my meaning here, it is necessary to remember the signification of the words, Kafiristan and Kafir, as well as the origin of their application to the country and people which they are at this day respectively employed to designate.

"Kafir" is an Arabic word, and means amongst other significations an "ingrate" or one who contemns or rejects a proffered benefit, as in "Káfirimat" one who is ungrateful for favours conferred, and "Kafir Khidmat" one who is forgetful of services rendered, &c., But in connection with religion it means an "unbeliever," "infidel." And in this last sense is applied by Mohammadans to those who either individually or nationally reject their religion, and the term generally carries with it a meaning of scorn or reproach.

"Káfiristan" is a compound term formed by the addition of the Persian particle or affix "*stan*" which denotes a place or time of the abundance or plenty of a thing, and means the "country of the Kafirs," or the place in which they are in plenty or abound above other things.

Familiar examples of a similar construction are the terms Afghanistan—the country of the Afghans, Balochistan—of the Baloch, Hindustan—of the Hindu, Kohistan—Highlands or the country of mountains, Zamistan—winter, or the season or time of cold, Tábitan—summer, or the season of heat, and so on.

But the term as employed to designate a country inhabited by infidels has a more precise meaning which is connected with the dominance of Mahammadan rule and the sway of Islám. And in this sense the term is applied only to such a region as both successfully repels that rule and entirely rejects that religion; and this in contradistinction to "Yaghistan" the term which is applied to such regions as repel the rule but accept the religion of Islam. For "Yághí" also is an Arabic

word and means "a rebel" or "one who maintains his own will" or independence; and "Yāghistān," like the examples just now mentioned, is a compound term signifying the country of such people, or in other words "Independent territory."

In fact neither "Kafiristan" nor "Yaghistan" are geographical terms, nor are they national terms in the sense of Afghanistan and Balochistan. They are merely names which indicate the special character, which is both accidental and mutable of the regions to which they are applied by foreign and hostile neighbours of the Muhammadan religion. They are not terms of native origin, nor indeed are they generally known to or used by the people to whom they are applied, although from long familiarity with the terms some of the border tribes of either region speak of themselves as "Kafiristani" or "Yaghistani," as the case may be, when in communication with foreigners.

Kafiristan and Yaghistan then may be regarded as regions, which, in the case now under our consideration, form portions only of a more extended area known in its entirety prior to the invasion of Islam by some other name or names, such as Bakhtar on the W., Bolor on the E., Badakhshan on the N., and Dardistan on the S. Though all these countries were formerly included in Kafiristan, the precise limits of neither of them is now known. But as "Bakhtar"—the Bactria of ancient history—(and of which Bolor perhaps is only another pronunciation) is the most extensive in area we may adopt the name here to represent the limits of the country formerly included in Kafiristan—that is the network of mountains and valleys lying between the upper Oxus and upper Indus.

The old names of the different divisions of this extensive area are not now in use, or even commonly known. It would appear that under the persistent, and for the most part unsuccessful assaults which have been made against this region during the past 800 or 900 years by the Muhammadan Governments acting from the sides of the North and the South, the old names were discarded and replaced by the comprehensive "Kafiristan." And this itself, as time wore on and the outlying tribes came to accept Islam was replaced—being no longer applicable—by the native names of the several districts as they were successively either subjugated to Muhammadan rule or proselytised to that religion.

The precise limits of the "Bakhtar" country are not now very well defined, but it certainly included that great boss of lofty peaks, elevated plateaux and fertile valleys formed by the junction of the great converging ranges of Himalaya, Hindu Kush, and Bolor Tagh or Pamir range. Roughly we may reckon "Bakhtar Zamin" to have originally comprised all that mountainous tract drained by the sources of the Oxus as far west as Badakhshan inclusive, towards the north; and all that little known mountainous region drained by the Kabul and Gilgit rivers—tributaries of the Indus—towards the South. Towards the East

Skardo may be taken as the frontier, and towards the west Panjshír and Nijráo.

Nearly all this wide area during the early years of the Muhammadan conquest was designated "Kafiristan," and its people collectively "Kafir." But the region thus defined contained a number of tribes bearing different names, independent of each other, and more or less hostile in their relations. And it is the same at the present day; but the different tribes—with the exception of one or two colonies of foreign immigrants—are all of one and the same stock, speaking very dissimilar yet cognate dialects derived from the Sanskrit, and possessing a common ethnological type as regards race features, and habits of life; and more remarkable still, claiming a common descent from the Greeks brought into these parts by Alexander of Macedon more than 2000 years ago.

For several centuries after the first introduction of Islam, the Muhammadan arms made very slow progress into the Bakhtar country, and have not even yet penetrated into the Bolor region on its eastern borders. Though the Muhammadan arms have been thus successfully resisted in all the more remote and inaccessible districts, the religion has proved less resistable.

Down to only the other day when they became to some extent at least Kabul territory or Kashmir territory, as the case may be, Badakhshan and its border districts of Wakhan, Shughnan, Roshan and Darwaz—on the north of Hindu Kush—and Chitral with Gilgit, Skardo, Chilas, &c.—on the South of that range—were all independent little states governed by local chiefs who ruled as hereditary kings, paying taxes neither to the Hindu nor to the Musalman, and such is the case with some of them still. But it is otherwise with their religion. They have all long since been nominally Muhammadan, and are consequently no longer "Kafir," nor their country "Kafiristan." Each tribe or people is named after the country held by it, or perhaps the country is named after the tribe. Any how instead of being now called Kafirs they are Badakhshí, Wákhi, Shughnái, Gilgití, Chitrálí, &c. according as they are natives of Badakhshan, Wakhan, Shughnán, &c. Or with reference to their free rule they are called collectively or individually "Yaghistani" or "Independent."

How Islam has been propagated in these parts I am not able to say. It is a very interesting subject for investigation. The religion has by slow degrees penetrated into the most remote parts of the country, and is slowly even now advancing into the yet untouched corner still designated "Kafiristan."

The explanation of the check to the advance of Muhammadan rule in this region by foreigners at least is to be found in the naturally very strong and difficult character of the country, coupled with the partiotism

and bravery of the natives. Whilst the slow advance of that religion since it appears to have, in the case of several independent tribes, been accepted voluntarily and on its own merits—is to some extent accounted for by the demand that has existed from the first introduction of Islam into this part of Asia for the natives of this territory as slaves. For we must remember it is unlawful for Musalmans to hold their co-religionists in slavery or to sell them into slavery, though it is allowed them to retain as slaves those whom they have acquired as infidels even after their subsequent conversion to Islam.

The natives of the mountainous region which we are now speaking of have been held in the highest estimation as slaves and domestic servants by the neighbouring Muhammadan nations from the earliest times of their rule in these parts, on account of their handsome forms and features, their intelligent and tractable minds, and their fidelity and devotion.

Up to the latter half of the 13th century the greater portion of Badakhshan in the north, and all the country southwards down to the plain of Yusufzai and the Lughman valley, in fact down to the Kabul river in its course through these two districts, was included in Kafiristan. At the time that Janghiz Khan visited the Peshawar valley and wintered in Swat, about the year 1230 A. D. these districts were occupied by Persian troops, and in the latter at least, which was then called Swati Gabri, the "Gabr" or "Fire worshippers" religion was still practised by the natives.

They were called "Kafir" in common with all other infidels by the Muhammadans, and also "Gabr" in contradistinction to the Hindu and Buddhist. And in the countries further west, from the entire predominance of infidels of this persuasion, the term "Gabr" came to be applied by Muhammadans in those parts as a term of abuse to infidels of any creed, and in the form of "Gaur" or "Giaur" as some very wrongly pronounce it, is still so used by the Musalmans of Turkey and Asia Minor.

About two centuries later than the time of Janghiz Khan the Yusufzai and Mahmaud Afghans, who had been dislodged by the Ghilzais from their settlement about the upper course and sources of the Tarnak river, invaded the Peshawar valley through the Khybar Pass, and possessing themselves of the plain country up to the Indus, drove the natives partly across the Indus into Chach and Pakli or Hazara, and partly into the surrounding hills of Buner and Swat. In this enterprize the two tribes acted together and shared the conquest in proportion to their numerical strength and line of operations—the Mahmands, from the Jallalabad side, getting the hilly tract which they now hold between the Kabul and Swat rivers, and the Yusufzais the plain country from the Swat and Kabul rivers to the Indus.

The history of this migration Eastward of these powerful and important Afghan tribes is described in detail in the *Tarikhi Murassa* of Khushhál Khan, Khatak, and some further accounts of it are contained in the *Memoirs* or *Tazkira-i-Akhund Darweza*, and also I think in the "*Tarikhi Guzida*." From these authorities it is gathered that the Yusufzais on first arrival found Peshawar—at that time called Bagráam, in the possession of the Dalazák people, who with the Afridi, Orakzai, Wazíri, Mangal, Khatak, and other cognate tribes, were classed as Pathans of the Karlanri division, and distinct from the Afghans. These Dalazák had been converted to Islam in the time of Mahmud of Ghazni, and gave that conqueror a strong contingent of their clansmen for his campaign against Sounát.

It appears that, they were for a long time a powerful and important tribe but they subsequently became weak through internal dissensions, and were now when the Yusufzai came against them easily defeated and driven across the Indus. But this did not finish the Yusufzai conquest. On the contrary the new comers entered upon a very troublous time with the dispossessed natives and their "Kafir" brethren in the hills circling the northern borders of their new conquest.

For twenty years a continuous warfare was waged against them, and finally the victorious Afghans—the Yusufzais on one side and the Mahmands on the other—either by the subjugation or expulsion, with here and there some extermination, of the natives, found themselves in possession of that extensive mountain region which they now hold from the Indus to the Swat and Panjkora rivers as concerns the Yusufzai frontier and Swat to the Kabul river as concerns the Mahmands. As the Afghans by degrees advanced into the hills, so the Kafir natives retired before them into the more inaccessible fastnesses of their mountains. Here and there some small and isolated community got surrounded and was either entirely exterminated, or subjugated to slavery, or granted protection on conversion to Islam.

As the Yusufzais worked up from the plain into the hills of Buner Swat, and Bajawar, so the Mahmands worked their way into the Gandhár hills—from the Jallalabad valley on one side the Khybar and from the Daudzai valley on the other side—the Kafir retreating before them to their present inaccessible seats. And so the country was cleared of the natives who had held it from very remote times and was peopled by new comers who call themselves "Bani Israil" and consider themselves a peculiar people.

For a long series of years after the Afghan conquest Ashreth in the direction of Chitral and Pashut in that of Kunar, with Asmar midway between them were the Kafir outposts against the Afghans, and though those districts have long since accepted Islam and passed out of the limits of Kafiristan, these towns are still the principal places through which intercourse is carried on with the Kafirs by the inter-

vention of their brethern and compatriots who have been converted to Islam, and are known by the significant appellation "Nimcha" or Half and Half," that is "Musalman Kafir."

By this conquest of the Afghans in the 13th century, which was part of that combined movement of Afghan tribes from Ghor set on foot by Shahábuddin Ghorí, as a means of maintaining his power over Hindustan by the aid of these warlike military colonists. By this conquest then, the territories of Buner, Swat and Bajawar were brought under the sway of Islam and no longer were included in Kafiristan. At what period or under what circumstances the other portions of the Bolor territory exclusive of course of the present Kafiristan were converted it is not easy to say.

The western borders of the country, that is the districts marching with the Kabul limits, were very probably early converted to Islam, but so late as the close of the 16th century the eastern districts of Badakhshan, namely Wakhán, Shughnan, Roshán and Darwáz, together with all the country Southwards as far as the Afghan limits in Buner, Swat and Bajawar were included in Kafiristan.

Since that period, however, a very considerable portion of this extensive area, the greater part of it in fact has accepted Islam, and thrown off the name Kafiristan. The conversion, however, is more nominal than real, and is characterized by a very noteworthy disproportion between the two conflicting sects of that religion, between the "Sunni" and the "Shia"—the orthodox and the heterodox churches. The tribal chiefs and gentry are every where "Sunni" whilst the commonalty and serf population are everywhere "Shia"—that is to say the masters are orthodox and the servants are heterodox. This is a very remarkable fact, and, considering the circumstances of the case, appears to me to have been purposely brought about in the interests of the slave trade, for as I mentioned awhile ago, the natives of this region have, from the earliest times of the Muhammadan rule in these parts, been highly esteemed and much sought after as slaves, and as a matter of fact they have for long centuries past supplied the slave markets of Kabul, Bukhara and Khiva with their choicest specimens.

Had these Kafirs been converted, in the same manner as their chiefs and gentry, to the "Sunni" or orthodox creed they could not be sold as slaves. But as Musalmans of the "Shia" or heretic creed, they are—notwithstanding their admission within the pale of Islam (a privilege which is not without its political advantages)—on a par with the "Kafir," and consequently the lawful prey and prize of the "Sunni." By this distinction of creed the "Sunni" chief is by the law of his religion endowed with the privilege of holding in slavery or selling into slavery his "Shia" tribesmen and compatriots. Whereas were they allowed to profess "Masters" religion they could no longer be so disposed of. Hence it is that by some, otherwise inexplicable arrangement, the

"Sunni" creed is that of the master class in this region and the "Shia" creed that of the servant class. The distinction has been undoubtedly kept up by the former in their own interests, for they are practically the great providers of the Central Asian Slave markets with their own subjects and countrymen on this side, just as the Sunni Turkomans are on the other with the Persian "Shia" of their hunting expeditions.

This change of religion has no doubt worked a considerable change in the manners and customs of the converted tribes but this is not so great as one might expect, and is in reality of importance more in a political than in a merely religious sense, for however nominal the conversion may be the professing tribes are none the less securely folded in the church of Muhammad, apostacy from which is promptly punished with death.

Most of the former Kafir tribes who have thus, during the course of the last 3 or 4 hundred years, become converted to Islam have not therefore lost their independence such as it is. They are still governed by their native chiefs, and though their tendency is to confederate with States professing the faith of their adoption they are nevertheless extremely jealous of any interference with their independence, and up to the present time, with few exceptions, they have succeeded in preserving the inviolability of their mountain homes. It is in consequence of this attitude of independence and conservatism that they are styled by their Muhammadan neighbours "Yaghistáni" or people of "Yaghistan," that is "Independent Territory," for having accepted Islam they are no longer "Kafir," nor their country "Kafiristan."

And this brings us to the true "Kafiristan" and "Kafir" of the present day. I proceed to speak of the country first. Compared with its former extent the Kafiristan we now have to deal with is a very small country being only about 150 miles in length by about 50 or 60 in breadth.

Its boundaries may be taken as the Hindu Kush on the north, including both its northern and southern slopes, from Lutkoh Darra on the east to the Faráígal valley or the range separating it from Punjshir on the west.

The Chitral river down to Chaghansarae or even Kunar on the East, forms the limit in that direction.

The Southern boundary may be defined by a line from Darra Nur on the east to Tagao on the west, all along the hill-skirts north of Lughman and across the several vallies opening into the basin of the Kabul river. Whilst on the west it is bounded by the Nijrao and Panjshir vallies.

Within these limits the length of the country lies obliquely from N. E. to S. W., and its greatest breadth is due East and west across

its central part. The whole area is mountainous, and furrowed by a succession, of long winding valleys, each of which has its own system of branches and glens ramifying into the recesses of the mountains, where they are mere torrent gullies flanked by precipitous cliffs and encumbered by huge rocks and boulders. As these torrent gullies expand into glens they form sheltered nooks and corners, and present small surfaces of level ground; and lower down where the glens open into the main valley there are here and there stretches of plain and meadow land, but these are everywhere much encroached upon by the spurs projecting from the hills on either side. So much so that my informant, a native of the country from whom this description is derived, declares that there is nowhere room enough to gallop a horse.

These main vallies and their glens are the seats of the habitations of the natives, and each valley is separated from its neighbour by an impassable mountain ridge, so that the people of one valley are cut off from free communication with those of the adjoining ones, and hence their peculiarities of language and manners.

There are four such main vallies, each of which is almost entirely occupied by the bed or channel of a considerable river. The largest of these is called "Kamdesb," and with its tributary vallies and glens comprises nearly half the area of the country. It is drained by the Kama river which joins that of Chitral near the town of Kunar, and is the only true Kafiristan completely inaccessible to strangers. For the other valleys which drain into the Kabul river by the Alingar, Alishang, and Tagao streams are, in their lower parts at least, in more or less free communication with the neighbouring Muhammadan tribes. Especially in the case of Ishpidarra and Farajgal the people of which are now mostly Nincha Musulmans, and with the adjoining vallies of Nijrao and Panjshir, further to the westward, are included in the Kohistan of Kabul.

These rivers during the summer season become swollen to violent torrents from the melting of the snows on the higher ranges, and are at times impassable for days together in their lower courses, where under ordinary circumstances they are usually crossed upon inflated skins, or "massaks" blown out with air. Higher up in the valleys and in the glens the narrower streams are crossed by rope bridges or by beams laid across from rock to rock as the case may be, much in the same fashion as in the mountainous parts of Kashmir territory.

The mountains of Kafiristan are described as extremely steep and rugged, and forming an intricate network of spurs, amongst which even the people of the country sometimes lose themselves. I suspect, however, that they do not much differ in general character from the adjoining mountainous districts of Kashmir territory, tracts which are not so entirely unknown to us.

The higher mountains such as Hindu Kush itself, and the primary spurs projecting from it, are covered with perpetual snows, whilst glaciers fill the hollows between them, at least on the southern slope of the main range. The highest hills near the snow are said to be bare of trees, as also are most of the low spurs which terminate upon the plain country or vallies of the Kabul and Chitral rivers; but the intermediate hills are described as covered with dense forests amongst the trees of which are several kinds of pine and the Deodar cedar.

It would appear in fact that the interior of the country in its general characters much resembles what we see in the vallies on the north and west of the Kashmir Basin—I mean the Wadhwān, Sind and Lolāb vallies—with which it is on about the same degree of latitude, and like which it produces the same sorts of fruit and crops. In the vallies of Kafiristan are found the walnut, apple, pear, plum, and other fruit trees including the cherry and diospyros, whilst the vine abounds every where both in the wild and cultivated state. Wine is one of the productions for which Kafiristan is celebrated, and its people have long been notorious for the free use they make of it as an ordinary drink. Many years ago, when attached to the Corps of Guides at Mardan, I employed two natives—one of Swat and the other of Jallalabad—to travel in Kafiristan for the purpose of bringing me information regarding its country and people and specimens of its productions. One of them on his return amongst other things brought me a loaf of mulberry bread and two bottles of wine. The latter was in leather bottles called “khīg,” which were very much of the size and shape of the caoutchuc hot-water bags we see in chemists shops, though the leather was like that of an ordinary massack. The wine was of two kinds, white and red, or rather the one was of the colour of chablis, and the other of Marsala. Both specimens were turbid and much alike in taste which was no ways inviting. To me the taste was like that of bad Sauterne with an extra smack of inkiness. Altogether there was a crudity of flavour and roughness which suggested the idea of imperfect fermentation, though the liquor was not wanting in strength, and I doubt not a tumbler full of it would suffice to make one comfortably fuddled barring of course disagreeable conduct on the part of the stomach, but with the Kafirs, probably, this long suffering organ has been schooled into complaisant behaviour. Any how it ought to be, for if the wine is not enough to try its temper the mulberry bread most certainly is. Indeed this is freely confessed by those who use it, and unlike the wine prolonged use does not conduce to a better agreement.

The specimen of mulberry bread brought to me was a heavy, dough like lump of dirty brown stuff in the shape of a dutch cheese. It was composed of dried mulberries coarsely pounded and firmly compressed into a tough cake, and had a sweet, mawkish taste.

A sort of stuff of which a very little would go a great way with one strange to the diet. It is a common article of food with the poorer

classes during the long winter months, and is said to produce various disorders of the digestive apparatus, which even the wine fails to correct.

Cultivation of the land owing to the nature of the country is very imited, but every available bit of ground is taken advantage of and carefully terraced into narrow slips of field against the steep hill slopes, much after the fashion of what we see in these hills, or more elaborately in those of Little Tibet. Tillage and field work generally is for the most part carried on by women, and the task is rather a laborious one, the soil requiring much preparation and liberal manuring. Where the surface admits of it, and this is generally the case in the lower vallies, the plough is used, and according to some accounts women are not unfrequently coupled with the oxen, but this I suspect is a libel on the gallantry of the "Kafir." Any how let us acknowledge that he deserves the approbrious name by which he is known should he really be guilty of such very brutal treatment towards the sex. The real state of the case appears to be this. The men are so constantly engaged in fighting, either amongst themselves or against neighbour tribes, and it is necessary for them to be so constantly on the watch against surprise by the enemy that they are required to devote their whole time to the prime duty of self defence, and hence the onus of all domestic duties, both house and field, is delegated to the women. But it is not to be supposed from this that they are habitually treated as drudges or on a par with their own domestic cattle. Rather they share with their lords the hardships of their common lot in life as well as its pleasures, and the division will, on examination, be found not to be an unjust one. For if the time of the men is fully taken up with warlike occupations and attention to the subordinate arts of carpentry, smith work and house building, and so forth, it is no great hardship, and far less a sign of degradation if household duties and field work such as this is amongst them be left to the women, and there is no ground for supposing that they on their part consider themselves unfairly treated, and this I think will become apparent when I come to describe the manners and customs of this people.

The principal crops raised in Kafiristan are wheat and barley, millet and Indian corn. Rice is also cultivated in the lower valleys. And in the more elevated glens where corn is raised with difficulty the "Amaranth" or "cock's comb" is cultivated for its seed which is ground into meal and used as a bread stuff for winter use. Besides these corn crops the Kafirs subsist largely on dried fruits, such as the walnuts, almonds, apricots, mulberries, pinenut, &c. together with the produce of their cattle such as milk, curds, cheese, and ghi, and they eat also freely of flesh without any prohibition of kinds, though fish, fowls, and eggs are never eaten. Their domestic animals are the same as those of the neighbouring countries, with the exception of the horse and camel which are unknown in the more inaccessible parts of the interior, and only rarely met with in the lower valleys bordering upon Kabul and Chitral. They possess great numbers of cows and sheep

which are mostly kept in the lower vallies, whilst higher up the country are found the domestic "yāk" and vast flocks of goats.

The principal wild animals of the country are the bear, leopard and wolf with the fox and other such animals. In the hills are found the Ibex and Markhor, the musk deer and a species of wild sheep probably *Ovis Ammon*. The common hill monkey is also met with on the wooded ranges.

These details give us a tolerably fair idea of the animal and vegetable productions of Kafiristan. The geology of the country is not so well known. The main ranges are probably of granite overlaid by various metamorphic strata, such as gneiss, amygdaloid trap and slate, with schists, and shales, whilst sandstones and limestones probably constitute the lesser ridges. From a description I have received of the rocks on the top of a hill on the eastern border of the country I conclude they are granite. They are said to form the circumference of a lake situated on the top of a mountain ridge the far end of which is occupied by a glacir.

Gold is said to be found in the country, but apparently in no great quantity, whilst nothing is known of its other mineral wealth. In some parts of the country landslips are of very common occurrence, and it is said that occasionally the narrower glens are quite blocked by masses of fallen rock; whilst many of the hill paths are at all times dangerous from the rolling debris of the bounding ridges which is set in motion by the wind or rain or the passage of some wild animal. This is entirely independent of the earthquakes, which too are of frequent occurrence, and sometimes very violent in their action. From this description of natural accidents observed in the interior of Kafiristan it would appear that that part of the country is similar in its physical characters to those parts of little Tibet or Ladak in which the like accidents are observed to occur, as in some parts of the Dras and Nubra valleys and their accessory glens and gullies.

With these data to go upon we may fairly conclude that Kafiristan in its general physical characters resembles that tract with which we are familiar where the Kashmir country joins that of Ladak, though of course on a smaller scale. In this view of the case the southern portion of Kafiristan will be a forest region with fertile vallies and sheltered glens, whilst the northern will be a glacier region with narrow inhospitable defiles and inaccessible snow bound gullies and ridges.

And this view is supported by what we are told of the climate of the country. In the lower vallies the winter, though severe, is hardly rigorous, and by no means longer than ordinary; whilst the spring and autumn are delightful seasons; with an intervening summer the heat of which is at times actually complained of as oppressive. In the higher and more northerly parts of the country including the Hindu Kush itself the case is different. Here there are properly only two seasons—

winter and summer—the autumn and spring being of very short duration and quickly passing into the longer season each respectively heralds. In these parts the winter and summer lasts fully five months and is during most of the time a rigorous season, the people as a rule being shut up in their houses for half the time. The summer too is equally severe in its own way, the sun's rays beating into the deep and narrow defiles with a force which is oppressive and quite enough to brown the skins of the natives.

We now pass to the Natives themselves—to the “Kafir.” I explained at the outset what is the meaning of the term and how it came to be applied to the people, or rather peoples, of whom those we are now thinking of form but a very insignificant fraction. However convenient the term may have been to the Muhammadans who applied it, guiltless as they have always proved of any weakness for archaeological or ethnological patronage, not to mention their depth of guilt in the opposite direction—and however applicable it may have been to the relative condition of the people thus vilified—though unhappily for themselves they were either ignorant of or indifferent to the true import of the term and the consequences of its ownership. However convenient and applicable, I say, the term “Kafir” may have been as a designation for this people under the circumstances of their situation with respect to the dominant Muhammadan natives that had sprung up around them, and fenced them in in their inaccessible retreats amongst the mountain fastnesses of their native country with a ring of implacable enemies, it does not in any way help us to a knowledge of who they are, or what is their origin. On the contrary the use of the worthless term during long centuries has tended to throw into oblivion the national name of the people and to cover their past history in a shroud of mystery.

And so it is that we find, within the ring fence of mountain country which I defined in the early part of this lecture a number of contiguous tribes who, after a long endurance as “Kafirs,” have gradually one after the other thrown off the opprobrious title by the adoption of Islam, and merged into the church of Muhammad with the loss of all but the most meagre traditional accounts of their origin and early history.

This is especially the case with the people we are now thinking of, and who still retain the title of “Kafir.” Their congeners of the cantons of Badakhshan and Chitral, including Gilgit and Skardo, have legends of a common descent—the chiefs from Alexander himself, and the people from his Greek soldiers; and their claim to this ancestry is not without some foundation for we are told by the historians of Alexander's Asiatic conquests that the king married the fair Roshána, a noted beauty, the daughter of a noble of the district which is now known as Roshan; whilst from the same authorities we learn that 10,000 of his Greek soldiers had taken to themselves wives of the country. But apart from these records we learn from history that the Græco-Bactrian rule

flourished for four and a half centuries in the mountainous region lying between the Indus and the Oxus, and it is fair to presume that during this period there was free communication with Greece.

It is in connection with these historical records that the "Kafir" people we are now speaking of, though they do not themselves advance any such claim, are by some considered to be the descendents of Alexander's Greeks by native wives; and certain of their customs have been adduced in support of the idea on the ground of their being of European origin.

The sitting on stools and benches and the drinking of wine are habits by no means confined or peculiar to this "Kafir" people alone. Many of the neighbouring mountain tribes use benches and stools, and drink wine too, when they can get it though since their adoption of Islam the indulgence is strictly prohibited. But as these people claim the same descent this argument does not perhaps carry weight; though if advanced on behalf of the "Kafir," who do not themselves pretend to any such descent, it should be the more freely accepted in the interest of those who do.

The "Kafir" people, so far as I can learn, have no national name either for themselves as a collective people or for their country, though those dwelling on the borders of the territory held by Musulmans, from constantly, hearing themselves so styled, have adopted the term, and in communication with strangers speak of themselves by the name "Kafir" without any sense of the meaning the word bears.

In the early centuries of the Muhammadan conquest the country on both slopes of Hindu Kush from Balkh to Kabul was called Bakhtar or "Bakhtar Zamín," the Bactria of the Greeks, but this name does not appear to be known to the Kafirs of the present day. I have sometimes heard their country spoken of as Kámdesh, which is the name of one of their villages, if it be not their capital town. The name Katár is also sometimes applied to designate Kafiristan, though more correctly I believe it belongs to the upper part of the Chitral valley. Both these terms are well known to the "Kafir," and are applied to their countries by the Nimcha Musalmans and natives of Bajawar.

As before stated the "Kafir" have no national name, but distinguish themselves by the name of their proper tribe. The principal tribes in the northern half of the country, and in communication with Badakhshan and Chitral are, 1 Sangalí, 2 Gambír, 3 Katár, 4 Gomá, 5 Tarí, 6 Mairahgal, 7 Damrú, 8 Káma, 9 Chanes, 10 Goshta, 11 Ding, 12 Wái, 13 Welí Wái, 14 Kámojí, and 15 Katoz. Those in the Southern half towards Lughmán and Tagáo are 1 Isphí, 2 Liushí, 3 Jamga, 4 Sanof, 5 Iskalk. 6 Parúní, 7 Yúní, 8 Pútoz, 9 Khullum, 10 Desh, 11 Wámá, 12 Ayrat, 13 Amishor, 14 Chímýa, 15 Kastúr, 16 Pím, 17 Pashágrí, 18 Mandí Gal, 19 Mínychásh, and 20 Aurang. From these examples it will be observed that the names bear a very Indian Sound.

Of all these tribes Kámojí is the most important, and is sometimes used to designate the whole Kafir people. In fact all the others are reckoned as merely branches of it. For according to the "Kafir" accounts their people were originally divided into only four tribes, viz: Halúr, Salár Kámoz, and Kámoj. The three first succumbed to the Muhammadan arms, and were converted to Islam, whilst the fourth, which they themselves now represent, adhering to the religion and customs of their ancestors, were forced to flee from their own country of "Gandhár" to the mountain retreats they now occupy. The "Kafir" trace the descent of these four original tribes from a common ancestor whom they call "Goráshí."

From the similarity of sound some Muhammadan writers have conjectured them to be Arabs of the "Curesh" tribe. But there is nothing whatever to support this idea. Others again consider them to be the descendents of the Persian tyrant of antiquity "Zohák."

Whatever their ancient lineage and history, however, there is one tradition of the "Kámojí," or "Kafir" people as we must still call them, which is of some importance and deserves our special attention as it gives us a clue to their antecedents before expulsion from their original seats. The tradition I refer to is that the "Kámoj tribe of Kafir" fled from their native country "Gandhar" before the hostility of the Musalman to their present seats on the Southern slopes of Hindu Kush. This is much the same account as that Elphinstone heard at Peshawar in 1809, and which led him after careful enquiry on the spot to the conclusion that (I quote his own words) "the most general and only credible story is that they (the Sigah Posh) were expelled by the Musalmans from the neighbourhood of Candahar, and made several migrations from place to place before they reached "their present abode."

Of the date of this expulsion there may be some doubt, but of the locality there is not the same difficulty. The "Gandhar" of the "Kamojí" traditions is not the "Kandahar" Elphinstone speaks of, but a country very much nearer their present abode. It is the "Gandhára" of the Greeks, a district which apparently included all that portion of the Peshawar valley which lies between the Kabul and Indus rivers; that is the territory now occupied by the Yusufzai and Mahmand Afghans.

The term "Gandhára" has long since ceased to be used as the name of this extensive tract of country, but it still exists as the name of a part of it which lies between the Swat and Kabul rivers, and is now occupied by the Mahmands. As the word is used at this time by the Mahmands, it is apparently limited to that hilly tract only which lies at the Southern base of the Kohi Mor and Sapari mountains and the range connecting them. And it is probably this very spot which the Kámojí Kafirs refer to as the country from which they were expelled by the Musalmans, for their migration thence across

the Kunar river and the Káma district to their present retreats in the vallies and glens drained by its principal river (which is an affluent of the Kunar stream) is much more easily understood than their conjectured migration from the far distant Kandahar.

In the early part of this lecture I referred to the invasion of the Peshawar valley by the Yusufzai Afghans, and mentioned that they were joined in the enterprise by their kinsmen of the Mahmand tribe. This invasion occurred at some time during the 14th century and occupied some twenty years of constant warfare before the Afghans finally secured themselves in their conquest of the country. The Yusufzai with some of the Mahmand clans in coalition with them, (they now hold that part of the country between the city of Peshawar and the Khybar), came through the Khybar Pass, and spreading over the plain which now bears their name gradually possessed themselves of the hill country bounding it between the Indus and Swat rivers. The Mahmand on the other hand, advancing through the Jallalabad valley, crossed the Kabul river below the confluence of the Kunar or Chitral stream, and forcing their way into the Gandhár country drove out the inhabitants and took their place—their tribesmen who went with the Yusufzais through the Khybar supporting the move from the side of the Peshawur valley. The inhabitants thus dispossessed were, it would appear, the “Kamoj” people, who fleeing from their homes sought refuge with their kinsmen settled in the Káma valley adjoining, and thence spread up the course of its river to their present retreats in the inaccessible glens of its head waters.

This being the case the “Kámoji Kafir” of the present day are the “Gandhári or Gandharians of 500 years ago, and, barring any previous dislodgment of the tribe are the Gandharidæ of the Greeks. That they are an Indian people is proved by their language and religion, though both present strange divergence from their originals as the consequence most likely of centuries of isolation and barbarism.

Some years ago when I was with the “corps of Guides” at Mardan a squad of eight natives of Kafiristan was brought down to the Regiment as recruits. Only two of them, however, were genuine Kafirs from the interior of the country, and they were named “Gara” and “Kachok.” The rest were from the border districts and were considered “Nimcha” or half and half neither true Kafir nor true Musalman.

These men in general appearance no way differed from the men of the “Afridi” company amongst whom they were enrolled, so much so that one personally unacquainted with them would fail to single them out of the ranks. None of them were fair complexioned, as are the Kafir slaves kept by the nobles of Kabul, whilst two or three were really dark, more so in fact than the Pathan of the plains. The natives of the higher parts of the country, however, are generally fair, more

especially in childhood and youth. These are called "Súr Kafir" or "Red Káfirs" by the people of Kabul and are in great request as slaves. Those of the low country are more or less dark, some of them very so, and are called "Tor Kafir" "Black Kafir."

The men whom I referred to just now as having been brought down to Mardan were simple minded, good natured fellows, and thoroughly unsophisticated in their ways.

They arrived highly elated at the prospect of meeting with fellow "Káfirs," for they had never heard us spoken of by any other name, and were evidently pleased with the cordiality of their reception by the officers. The novelty of the situation, however, soon wore off, and no more port wine forthcoming—for which, by the way, they evinced a remarkable partiality to the very serious lengthening of our mess bills—the monotony of drill with the restraints of discipline, and the tedium of garrison life in the hot weather palled upon them, and produced a longing for the cool air and free life of their native hills, a longing which oppressed them and rendered them discontent with the service. After some months they got leave to visit their homes in parties of two or three, and once away across the border they were never heard of again. During their stay at Mardan I endeavoured to get some information regarding their country and language but for want of a common medium of speech the task proved tedious and not very reliable in its results. A while later, however, I came across another Kafir at Peshawar and as he had a fair knowledge of the colloquial Persian I essayed to verify my former notes and prepare a vocabulary and grammar of his own language. The work proved a most difficult task, owing to constant misunderstandings and loss of temper on both sides and I finally gave it up as a hopeless job. I have no intention of inflicting upon you a Kafir vocabulary, but venture to give you instead an example of the affliction encountered in the preparation of such, merely premising that it is an Indian dialect closely similar to that spoken by the Pashái tribe, and also easily understood by the kindred Lughmání and Degání. With my "Kafir," a poor man of the labouring class, our lessons were something in this wise.

"Now you clearly understand you are to repeat to me in your own language the words I speak to you in Persian."

"By my eyes. Certainly, I understand. You speak in Persian and I say the same in my language."

"Very well. Thats exactly it. Now begin. "Gosh" what do you say for "Gosh."?"

"What do I say for 'Gosh,' why 'Kain' of course, what else?" "All right" and down goes "kain" for "ear."—"Clashm," what's that in your language?"

"Achch,"—and down goes "Achch" for "eye."

"What do you say for "Bíni." ?

"Nós."

"That's odd. We also call it Nose."

"Of course you do. We are brothers, aint we? You're a Kafir and I'm a Kafir, and we have the same word for the same thing. Where's the oddity?"

"Very well, perhaps you're right. Now let's count. You begin on your fingers and I will write it down."

"One, 2, 3, 4, 5" on the fingers quickly, and then a turn over to the other hand.

"Hold hard ! Gently ! Give me time to write them down. I've got "one, two, three, now go on."

"Four, 5, 6, 7, 8, 9, 10," with a pause between each, and then a drop of the hands and a look of self satisfaction at the successful enumeration, on his part. On mine, writing—"Nine, ten—that's all right. Now go on."

"Go on ! Where to ?" With blank surprise.

"What comes after ten ?"

"After ten?" with a somewhat puzzled look of enquiry.—"Why I've given you the whole ten; what more d'you want?"

"Can't you count more than ten?"

"Count more than ten? What d'you want more than ten? I've given you the whole lot 1, 2, 3," counting them over his fingers again.

"I see you are getting tired and confused. We will leave the numbers for another day. Meanwhile here's some snuff to clear your brains a bit. Presently we will try the conjugation of a verb."

I left my teacher a few minutes to enjoy the liberal pinches he had snuffled up with great gusto and snorts vigorous enough to have searched out the innermost recesses of his very ugly nose, whilst I arranged the words already written down. This done we resumed our lesson.

"Well! *Damàghat chàgh.* Are you ready to go on?"

"*Ba chashm.* Yes! I'm ready. What is it?"

"You remember what I told you? You must repeat in your own language the words I speak to you in Persian."

"Yes, yes! I understand," taking up another pinch of snuff with play of finger and thumb preparatory to further refreshment.

"Very well! Now listen!—"I am."

"Yes! I see you are."

"No, no! that's not what I want. I want your words for it. Listen again!—"Thou art."

"Of course I am. Ain't I talking to you?"

"Bother your stupidity! Try once more. Now look here! Listen to what I say."—"He is."

"Is he! Who is?"

"Oh! you intolerable blockhead! Now drop that snuff," with a slap knocking it out of his hand.

"Don't you know your own language!"

"Blockhead! That's good! Don't I speak straight to every thing you say, and if you can't understand, why am I the blockhead?"

"Now don't lose your temper! Take another pinch of snuff, and compose yourself, then after a pause, "Now go home for to day. Next time we will start with a better understanding. But you're a sorry blockhead all the same."

This was enough for the day, so after some amicable explanations I dismissed my barbarian, with a small present.

"When shall I come again?" For the bright rupee was a thing my Kafir had rarely handled and to him was a very handsome retaining fee, and hence his eagerness to renew the contract.

"I'll send for you when I have leisure. Meanwhile go to my servant 'Hassan' and he'll feed you"

Of the manners and customs of the Kafirs we have no very detailed accounts though what information we have justifies us in classing them with the people of India.

The people have no settled form of government conducted by one acknowledged chief or king, and are entirely illiterate, without books or writing of any kind. They have, however, certain chiefs or heads of families who exercise a sort of patriarchal control over their

dependents, and have the power of keeping the poorer members, especially orphans and widows, in bondage, and of selling them into slavery.

These clan leaders or chiefs are called "*Sābonnash*," and are usually appealed to for the settlement of family disputes, which as a rule are adjusted by amicable arrangement. On the whole the power of the chiefs in matters affecting the common interests of the family or tribe is strictly limited, and mostly dependent on the will of the people. Practically in fact, each man is independent so far as his power goes, and subordinates his will only to the common interest of the society of which he is a member. It would appear in short, that in their social condition these people (making allowance for the effects of changes in religion) are very much on a par with their former neighbours the "Afridi," with whom they have many points of resemblance, especially in respect to features, complexion, mental character and moral qualities. They are extremely jealous of their honor as they understand the word, keep the stranger out of their country with even more jealous vigilance than the Afridi, and are as fickle, revengeful and treacherous as the Afghan. On the other hand they are brave in fight, and hospitable and gay in their social gatherings and superstitious to a degree.

I have likened them to the Afridi, their ancient neighbours, and may here state that Herodotus mentions the Aparytæ and Gandarii as being included with the Sattagydæ and Dadikæ in one satrapy. The Aparytæ of Herodotus are the Afridi of to day, there is no doubt. With the identity of the two last we are not just now concerned. But this much I think we may consider as certain, with regard to the others, namely, that the "Kamoji" people, or Kafirs of the present Kafiristan, are the same people as were driven out of Gandhār by the Mahmand Afghans who now hold that country, and that they were so driven out into their present retreat about 500 years ago. And further, in default of record of any previous dislodgement we may conclude that they were the ancient inhabitants of that country, and the same people as are mentioned by Herodotus under the name of Gandarii or Gandarians.

In further support of this view I may mention that the Sāpi tribe which is reputed to be the most recently converted of the Kafir tribes is also known by the name Gandhārai, which is more properly the name of one, the chief one, of its five divisions. The Sapi tribe is reckoned at 12,000 houses in all, but is much scattered in small settlements all over the country from Tagao to Kunar and Bajawar. Almost every village in Swat has one or two or more Sāpi families, and they are also found amongst the Mahmands and Utmankhels. The celebrated Akhond of Swat was a Sāpi of the Gandhārai section or division. The Sāpi count themselves Saraban Afghans, but are not Afghans at all.

The "Kafir" are by no means destitute of all semblance of civilization in the midst of the barbarity of their surroundings, though

they have undoubtedly fallen from a former higher level than that they at present show any signs of. And this we may fairly conclude from a consideration of their religion and mode of life at the present day, so far as the accounts we receive enable us to judge.

The time allotted to me is, I see expired, and I will therefore not further trespass on your patience, more, than to say that the Kafir, of to-day have evidently, from the character of their religion and customs, been mixed up with the tribes around them from very early times.

They live in small village communities, scattered about in the sheltered nooks and commanding spurs of their hills. In their lower valleys some of the villages are of considerable size and contain from 200 to 500 houses many of which consist of 3 or 4 stories. These are described as commodious and substantially built of wood and stone, and tastefully decorated with wood carving of elaborate workmanship. In the higher parts of the country the villages are sometimes built up the slope of some steep bank rising above a torrent stream. And in such situations the houses rise in terraces one above the other, the flat roofs of one row forming the street in front of the row next above.

The names of the principal villages are as follows, and they are so called after the tribes inhabiting them. Those in the northern half of the country are Kámdesh (after the Kama tribe) Wáigal (after the Wái tribe), Gambir (after the tribe of that name), and soon with Katár, Gúmá, Merahgal, Chanesh, Damrú, Sangal, Goshta, Díng, Kámojí, Káigal, Rachgal, Dóigal, Nisigrám, Sonandesh, Pandesh, &c., Those in the southern half are Wainá, Pashágri, Pímichgrám, (after the Pím tribe), Ishpí, Sanoí Iskilk, Linshí, Yúni Parúni, Deshá, Patoz, Ayrat, Khullum, Ameshor, Chumyá, Kastúr, Manchgal (from the Manchyásh tribe), and so on. The terminations desh,—gal, and —grám it will be observed are purely Indian and equivalent to des,—garh,—gámo.

The main occupations of the “Kafirs” are the tillage of the soil and the care of their flocks, but these are at times much interrupted by the constant state of hostility they live in either amongst themselves or with their neighbours, so that they are for the most part left to the women. Sometimes the war is so prolonged and so actively waged that the men are entirely occupied in its pursuit and unable to quit their posts for days or even weeks together. On these occasions the women carry them daily supplies of food and other necessities.

But this is not the unvarying state of affairs, and even with the “Kafir,” life has its pleasures, and from all accounts they are enjoyed as freely as by other people less unfavourably situated. They are said to be extremely sociable in their habits, and when not more seriously employed, devote themselves with lively energy to a round of music, dancing and feasting in which all join alike without distinction of rank or sex, and usually with the greatest good humour and friendliness.

Patriotism and hospitality are considered the two highest virtues, and he who has slain most of the enemy (always the Musalman) and given the greatest number, of feasts is the most respected during life, and the more surely deified after death.

The arms of the "Kafir" are a hatchet and bow and arrow, with one or two daggers which are always worn in the waist belt. Of late years some of the border people have become possessed of fire arms, but they are not commonly in use.

Their dress is of much the same kind for both sexes, and differs in material only according to the rank of the wearer. The clothes of the better class are of cotton or woollen stuff, and consist of a loose shirt and drawers, with a sash wound about the waist. They also wear a round cap which sometimes is set off with a band of red cloth for the women. In the cold weather they wear over these either a fur coat or chogha or a blanket. The poorer people in the northern parts of the country wear garments of goatskin with the hairy side outwards, and these generally being of a dark colour they are called "Siyah posh Kafirs" or "Black clad Kafir."

The men wear the hair in long ringlets at each side, but have the top of the head shaved. They also wear rings of gold or silver. The women, are said to wear the hair plaited over the temples, and in long braids down the back. They wear rings and bangles of pewter or brass, and necklaces of cowrie shells and beads of glass or stone. They are in fact fond of finery of all sorts, but very little is known of the kind of ornaments they wear.

The Kafir women have a world wide reputation of being very beautiful creatures, and are said, by those who know them best, to surpass in fineness of features, delicacy of complexion and turn of limb. This estimate, however, I suspect is a mere matter of comparison, an opinion formed according to the lights. I am sure that any body who stands where I am now, would not again speak of Kafir beauty!

There is so much to be said about the manners and customs of this interesting people that it is impossible to compress into the short limits of a lecture all that belongs to the subject. But rather than leave it incomplete by the omission of such important matters I will, with your permission, before concluding, describe very briefly the main characters of their religion and the rites observed on the occasion of "Domestic Occurrences," Marriages, Births, Deaths.

Of the religion of the Kafirs we know very little. But from that little it appears to be an odd mixture of the three great religions that have successively flourished in the country of which they are the natives, that is to say of Brahmanism, Budhism, and Zoroastrianism. They believe in a supreme God whom they call "Dágon" or "Dogám," but they worship idols of which they have a great number, and sacrifice to

them as intercessors with God. They recognize a heaven which they call "*barí lábalá*" and a hell called "*barí dugar balá*." They have priests whose office is hereditary, and whose principal duty is to superintend the rites observed at sacrifices, at births, marriages and deaths, but they exercise no influence or control over the people, nor do they prescribe any special form of worship, nor times and seasons of worship and sacrifice.

In these matters the people follow their own inclinations and are much given to prayer and sacrifice before their idols. On these occasions it is absolutely necessary that fire be present, and it is also essential that all offerings presented to the idol be first passed over the fire.

The animals most commonly sacrificed are the ox and goat, but with the exception of the dog and cat, fowl and fish which are never eaten, there is no prohibition of any kind, and the flesh is always eaten by the family and friends of the sacrificer, a portion being the right of the priest. The animal is killed by striking off its head with a large knife or an axe, and its blood is sprinkled over the idol. Some idols are worshipped in the open air and others in temples called "*Imráomá*."

The Kafirs know by name and worship the Hindu Gods, Indra and Mahádeo, and they have besides many others the principal of which are "*Bágesh*," the God of water, "*Máni*"—the destroyer of all evil, or the Preserver, Ges, Maraz, Púrám, Atrám, Parádik (this idol is a group of 7 brothers made of gold and set together in front of a tree of gold), Dóni, Súrjú, Nishi, Kunú (who is supposed by Musalmans to be the wife of Adam), Disámí (who is the wife of the Hindu God Ganesh), Murnít, and others. These idols are generally carved out of wood, but they are often of stone, and some of them carry a trident (or trisúl) like the Sadasheo of the Hindus. Each tribe has its own patron idol which is called "*Dágon*" in addition to its own name.

Besides these idols the Kafirs are said to have numerous statues and figures of deceased ancestors. These are described as representing male and female figures in various attitudes standing, sitting, riding &c.,. Allowing that they do make images of their ancestors as is done by some Hindú hill men, still I am very much inclined to consider these as merely relics of Buddhist sculptures similar to those with which the Yusufzai country abounds, and of which our museums now have many specimens, more or less damaged though they are by the destructive fury of the Musalman conquerors.

The Kafirs sacrifice to their idols at any and all times, the flesh being always eaten with festivity. But there are some sacrifices appointed for special seasons. The most important of these is at the Vernal Equinox and the festival lasts ten days. It is followed by a carnival in honor of Mahádeo, when amongst other pranks the Kafirs pelt each other with earth, as do the Hindús one another with "*galál*" in the "*Hók*."

Such are the general characters of Kafir worship, some other peculiarities will be mentioned in connection with their funeral rites. But before we come to that we must speak of their marriage customs.

Marriage amongst the "Kafir" is apparently a very simple business, and the tie rather a loose one, very liberal if not latitudinarian views being entertained in respect to the moral obligations of the married state. On the other hand chastity before marriage is carefully guarded, and any *faux pas* brings disgrace upon the girl and her family. But it does not appear that *laches* in these matters are visited with the exemplary punishments so rigorously enforced by Muhammadans for the like kinds of dishonor.

The marrying age amongst "Kafirs" is from 20 to 25 for men, and from 16 to 20 for women. There does not appear to be any period of courtship, the betrothal and marriage being settled in the following business like manner.

The suitor, or would be Benedict, takes a goat, plump and free from blemish, to the house of his "intended" and offers it to the father or other guardian in the name of the maiden of his choice. If the donor is approved of, his gift is accepted, and the father of the maiden forthwith strikes off the head of the goat preparatory to the family feast, which clinches the bargain, and the "accepted" then sets about his wedding arrangements.

Before the goat is accepted, however, sundry preliminaries have to be adjusted, such as the price of the bride and the amount of her dower, and in these particulars the maiden is always consulted and allowed to decide according to her own free choice. In cases where the important question is not at once decided by the acceptance or refusal of the proffered gift, the goat is retained a certain number of days pending further consultation. If after the expiry of this period the goat is returned to the donor his suit is considered as rejected and the "match is off." But its retention is considered a token of encouragement, and, negotiations proceeding smoothly, its final sacrifice, as just stated, confirms the bargain.

After the feast upon his goat, in which he participates as one of the family, the bridegroom elect returns to his own house, and next day, himself following later, sends to the house of the bride elect the various articles of her dower. These consist of a suit of clothes, jewellery, some lengths of colored cotton (from Kabul), and a set of cooking utensils. The last are used in the preparation of the feast, which is that day given by the father of the maiden; and on the arrival of the bridegroom, the bride is clothed and decked out in her new suit and jewellery and presented to him; the father at the same time presenting her with a silk scarf and some jewellery, and giving a cow, and if he can afford to do so, a slave also to his son in law.

After the feast, or "wedding breakfast," as we should say, the bride is attired for her departure, and as she steps out of the house a basket, crock or "*khalta*" is fixed on her back by shoulder straps, and into it are put a quantity of dried fruits, almonds, walnuts, &c., conserved in honey, and, if the parents can afford it, a silver wine cup. With this load the bride walks to the house of her husband escorted in procession by the whole village with music and song.

The wedding guests here serenade the newly joined couple with music and songs for awhile, and then after the distribution of fruits and wine disperse to their own homes.

A day or two later the bridegroom pays to the father the price of his wife, which is called "*shírbahá*" by the Musalmans and sometimes amounts to as many as thirty cows.

This completes the marriage so far as the parents of the girl are concerned. The priest throughout having nothing to do with the ceremony except as a wedding guest. But it occasionally happens that the bride, much to the disgrace of the family, is returned to her parents as "disapproved." In this case she is deprived of her dower or wedding gifts, and the "*Shírbahá*" is of course withheld.

Divorce is not known, as amongst Musalmans, but it is said to be a common occurrence for married couples to separate by mutual consent, and contract fresh alliances at their pleasure.

Polygamy is allowed but is not much practised, except by the wealthy who, also, keep slaves both male and female. These are always poor or friendless Kafirs, either captured in war from their neighbours or seized from the weaker sections of their own tribe. Musalman slaves are never kept, all such captives being invariably put to death. These "Kafir" slaves are called "*báírí*," and include in their ranks all the servant, artificer, and labourer class. In fact the term "*báírí*," may be held to mean "Serf" in opposition to "*síyál*" which means "noble" and is applied to the free and wealthy classes.

The ceremonies observed by the "Kafirs" on the birth of a child are very curious and interesting. The expectant mother is removed to a house outside the village especially appropriated to the purpose, and kept there till 24 days after the birth of the child. Then all being well the mother and child are conducted back to the village with music, and songs and dancing.

After some weeks a feast is given for the naming of the child, and the name is selected in the following curious manner. The mother holds the infant in her arms ready to feed it, whilst the names of its grandparents for several generations according to sex are successively repeated over it. And Baby, as babies generally do in the like situation, very soon helps itself to what it wants, and the name which

happened to be mentioned at the moment of its doing so thereafter becomes its own.

The common names for men are 1 Chandalú, 2 Demú, 3 Hazár, 4 Tyúzar, 5 Mírah, 6 Budel, 7 Bastí, 8 Gárá, 9 Garnásh, 10 Azar, 11 Káchuk, 12 Kimrak, 13 Pakhola, 14 Dronás, 15 Kohaki, 16 Chodar, 17 Trímú, 18 Dabdíng, 19 Palak, 20 Udúr, 21 Zázai, 22 Kamar, &c.

Those of women are 1 Málí, 2 Júnbalí, 3 Masánki, 4 Janúkí, 5 Dilerí, 6 Zorí, 7 Spái, 8 Páglí, 9 Biyás, 10 Urári, 11 Málakí, 12 Pakúkí, &c.

The list is varied, and may be perhaps profitably consulted by the "paterfamilias" blessed with more quivers to his bow than he can well find names for.

We fail to trace the early years of Kafir life. Perhaps they are a period of natural innocence and happiness, only disturbed by the raids of the slave hunter, and the kidnappings of his vile agents—either Kafirs themselves or their renegade kinsmen, the "Nímcha."

We hear of no schools or lessons to worry the youthful mind, of no priestly restraint, nor social discipline to guide the conduct of the man. We only hear of their doings and actions as men and women—of their household duties and domestic cares, coupled with religious exercises and worship; of their frequent feasts and merry makings with music, song, and dance; and of their tribal wars and family fights, with a never ceasing vigilance and self defence against the common enemy, the Musalman foe. And then the end of all, their funeral rites.

The funeral ceremonies observed by the Kafirs are very peculiar, and indicate the former connection of the people with the "Gabr" or "Zoroastrian" religion—the practice of the Fire worshippers. The Kafirs neither burn their dead as do the Hindú, nor do they bury them like the Muhammadan. They dispose of them in the following manner.

The corpse is arranged in the deceased's best suit of cloths, and laid out on a charpoy, and if a man, his bow and quiver, daggers and knives &c. are laid by his side.

The relatives then take up the charpoy and carry it round the village accompanied by all the people, who sing and dance as the procession advances. At length the corpse is set down opposite some idol whilst the men of the village wearing their arms dance round it with wild shouts and gestures, and grotesque attitudes and boundings. The women then take their place and for a while lament over the corpse filling the air with their wails and sobbings. Finally the corpse is removed from the charpoy and laid in a wood box and shut up. The coffin is then carried away to the top of some hill or other solitary place

and deposited there under the shelter of some rock or shade of some tree and so left. This concludes the funeral which is then followed by a feast given by the deceased's relatives.

In the case of wealthy or well known men the deceased's heirs, once a year hold a feast in his memory, and a portion of the food is set aside outside the house for the refreshment of his soul, the guests the while calling on him by name to come and eat.

Another curious custom the Kafirs are said to observe in connection with funeral ceremonies is the following. When a friend, a few days after the funeral, calls upon a mourner to condole with him in his bereavement, he announces his arrival at the door of the house and on admission, removing his cap throws it with a violent gesture on the floor at the entrance to the room in which the mourner is seated. He then draws his knife or dagger and stepping up to the mourner takes him by the hand and raises him to his feet. He then kicks him all around the room, sets him down in his former place, sheaths his dagger, and picking up his cap goes his way. If this be strictly true and generally practised, the unfortunate "Kafir" mourners must endure a double affliction and have a hard time of it till the days of mourning be over, and may well cry "Save me from my friends!"

I mentioned before that the Kafirs made images of their defunct chiefs and heroes, and considered them as Gods. But it is not many who are thus deified owing to the difficult qualifications required during lifetime.

The best passports to deification after death are profuse liberality and public hospitality during life, or the erection of a roadside gateway. This last it appears has no practical utility, but always endows the builder with a certain sanctity and celebrity which entitles him to deification after death. These gateways or portals are simple constructions at the side of public roadways near the entrance to a village, and consist merely of two upright pillars, of stone masonry supporting beams of pine wood which are covered over with plaster and lime cement. It is not stated whether they ever contain any idols, but from the general similarity I suspect they resemble the like roadway arches seen on the outskirts of Buddhist villages in Little Tibet.

"GENERAL ROBERT'S SPEECH."

Ladies and gentlemen. Dr. Bellew has given us a very interesting lecture, and I would on behalf of all here, offer him our best thanks. Very few men are so well qualified to treat the subject which he has selected for his lecture; very few men have mixed so much with the races of Central Asia; and few men have travelled so far in the countries beyond our Frontier. Dr. Bellew has mentioned that Major Tanner is about to visit Kafiristan, a country hitherto quite unknown to us all, and inhabited by people almost equally unknown. We have learnt

a good deal of both this afternoon and I hope that after Major Tanner's visit, we may learn still more.

Great progress has been made during the last few months in our knowledge of the countries and tribes of the North West Frontier. It cannot, of course, be expected that we can travel without risk, in this country, all at once; or that the people will prove loyal subjects, or friendly allies. The traditions of the Pathans, a bigoted and fanatical race for the most part, are all against permitting their pride of country to be levelled without a struggle, or admitting us into their country. But I am not very sure whether the Afridis, Mangals, and other tribes are much worse than the forefathers of some of us were. The Highlands of Scotland were not certainly always safe; and, though I am bound to admit that nothing but what is good can come from Ireland now, and one can travel from one end of that country to another with perfect safety, it was not always so. I am, however, sanguine that our whole frontier will very soon become peaceful, and that the tribes on becoming accustomed to our rule will settle down, those that live far away will visit us, and will let us visit them.

When they do, I hope that some of us will explore Kafiristan, and that Dr. Bellew may be with us to introduce us to the people he has told us of this evening.

II.

THE ANGLO—AFGHAN WAR.

BY

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Translated from the "Austrian Military Zeitschrift."

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From the Amu Daria and the Turcoman steppes, to the deserts of Biluchistan, from Persian Khorassan to the valley of the Indus, stretches the country of the Afghans.

Men of renown and events weighty in results have stalked through the land of the Afghans. Its records tell of the tragedy of the English Campaign (1839-1842), of Shah Nadir the butcher of Delhi (1738-1739), of Baber Khan the founder of Mongolian rule in India (1520), of Timur the assailer of the world (1398), of Gheughis Khan (1218-1224) the annihilator of the civilisation of ancient Asia, of the widely ruling Sultan Mahmud (1000 A.D.) They relate the story of Alexander the astounding, the divinely favored Macedonian. Afghan history dies away in the hymns of the Indian Vedas 1800 years before the birth of Christ.

Not only has Afghanistan a past full of instruction, and interest but it has also an eventful present, and a future pregnant with momentous possibilities. The war which began on the 21st November 1878 is, who can doubt it? neither more nor less, than the preliminary war note of the two rivals for supremacy in Asia,—all powerful Russia, and England.

Thus England's declaration of war against Afghanistan is but one link in the chain, with which Great Britain seeks to bind its hated rival, a chain of which the several links are easily enumerated:—the formation of the Disraeli Cabinet, the buying up of the Suez Canal shares, the occupation of Quetta, the pompous installation of the Empress of India, the armed fleet in Besika Bay, the protection of the Turks, the taking possession of Cyprus, the Euphrates valley railway

NOTE.—A German short mile is equivalent to 3.9 English miles and a German long mile to 5.75 English miles. A Metre is equivalent to 39.37 English inches and a Kilometre to 3280.899 English feet or .62135 of a mile. A Gulden is equal to a florin or two shillings of English money.

scheme, and the acquisition of the island of Ormus in the Persian gulf. Will this chain withstand the opposition of the Colossus of the north? We will not attempt to solve the riddle of the future. That however the present state of things in Asia precludes the possibility of an amicable solution, and that sooner or later a conflict between the two powers is inevitable, is as clear as day.

Russia is a state formed, and constantly increased by a stupendous power of expansion; from having been, up to the commencement of the reign of Peter the Great, an almost inland kingdom, it has since that time extended its boundaries from the Baltic to the Black sea. With the mathematical precision of an attack upon a fortress, cautiously grasping its neighbor's territory, and annexing the spoil, it has known how to assimilate at once each conquered country into the unity of the state. Thus have Finland, Ingria, the Baltic provinces, Livonia, Courland, Lithuania, Poland, Bialystock, Volhynia, Podolia, part of Ukraine, Bessarabia, Chersonese Taurus, Kuban, and the countries of the Caucasians, Georgians, and Armenians been swallowed up. In central Asia about 50,000 square miles have been annexed, the district of the Amur has been increased, a firm footing has been obtained in Saghalien to the furthest east, and last but not least, what has not yet, but surely will soon be, arrived at, free access to the open sea.

And who can maintain that Russia has weakened herself by these almost unlimited extensions? She is at the present time, a large, almost unassailable, and, compared to other countries, a morally united empire, containing 74 million souls; a state doubtless with its intelligence, and mind still in an embryonic condition, deeply imbued with the force of development, and perhaps some what weakened by it,—a disease which older countries have already passed through—but yet which has already accomplished three most important steps towards civilisation—the abolition of Serfdom in 1861, the completion of its network of railways, and its acquisitions of territory in Central Asia, where it has established public order in the place of anarchy. Russia has before her a grand programme, so to speak, access to the open sea, through the Persian gulf to the Indian Ocean, which opens the world to her. While acknowledging that such a programme can only be realised, and carried out by means of "blood and iron," she has accepted that stern, and painful obligation. In short Russia stands before the world as a firmly established power, with a grand future, and the boundless strength, which is necessarily conferred by a population of 74 millions.

Great Britain is a State, whose possessions, so far from forming a united whole, are scattered over the entire world; whose colonial belongings are so enormous, that the mother country can no longer exist independently of them; whose programme must be, not that of enlargement, but of maintaining its "status quo." In spite of her substantial prosperity, and notwithstanding a military budget of 340 million gulden England has neglected her military system to such a degree, that, compared

with the large continental powers, she can hardly be said to possess an army at all. Her sons are too wealthy, and luxurious to care to acknowledge, or undertake the duty of coming to the help of the Mother country in her hour of danger.

This Kingdom, whose honor and security, to quote an English Member of Parliament, depend entirely in its fleet, has, during the last half century, been daily, more and more dangerously threatened, in its most valuable colonial possessions, by Russia, the largest power of the world.

The greatness of this danger will become evident, if we examine more closely the situation, and circumstances of British India. With the sharp eye to material gain peculiar to the Anglo-Saxon race, England has established a firm footing in Hindustan, the Italy of the east, and has now maintained it for 300 years. Her progress, at first slow, has since the middle of the last century, been prodigious; by strength of will and successful wars, and by making judicious use of the interhostility of the weak native princes, she has now, with a few trifling exceptions, subjugated the whole of Hindustan. She governs a country of 76,000 square miles, and 240 millions of inhabitants. The East India Company and its successor, the Crown of Great Britain, have not dealt with this valuable prize in the spirit of the noble Macedonians of old. England conquered India with the sword, and still considers it, and rules it as a conquered country. In short it has been, and is to her simply a mine of wealth to be worked, a milch cow supplying England with butter.

This system of Government has borne its fruit. No one in England deceives himself as to the feeling of the people of India towards their "benefactors." Sir Richard Temple, the Lieutenant Governor of Bengal, says in one of his reports as to this feeling, that there are four classes, who from their customs must necessarily be hostile to England, and these are, 1st the Priesthood whether Hindu or Mahommedan; 2nd the Military party, and the well educated politicians; 3rd the Native Chieftains, and Princes who have been dispossessed; 4th and lastly the populace.

Temple goes on to say, "The deadliest hatred is nourished by the Mahommedan priesthood; it burns with an undying flame. After what I know of Delhi, and what has been reported to me regarding Hyderabad from authentic sources, I believe that the tiger does not long more greedily for his prey, than the Mahommedan fanatic thirsts for the blood of the white infidel. All this is very grievous, but it is useless disguising a fact, which cannot be contradicted."

The necessary result of the system pursued by the British has been the material ruin of India. It is true, that internal peace has been established, agricultural highways opened up, irrigation works carried out, 11,300 miles of railway laid down, and—last but not least—an Anglo—

Mahommedan University established; but on the other hand, native manufactures have been completely destroyed, the exhausted land has been forced without sufficient manuring, the country has been burdened with intolerable taxation, which has introduced the village money lender with his 12, 24, and 60 per cent. While a yearly sum of 200 million gulden goes from India to England as English profit, the Indian community under English rule, has been impoverished to an alarming extent. Investment of capital is hardly understood in the country, and all such transactions are made in English money. In the Madras presidency alone, there are it is computed 16 million poor. In the last 20 years, a deficit has been declared 16 times, and within the last 3 years, the collective amount of these deficits has reached £16 million sterling.

The expenditure on the Indian Army is exorbitant. It amounts to £18 million, i.e., 45 per cent. on the whole public revenues of India. (40 million). The maintenance of 62,000 British troops, the cost of which should be borne by the Mother country, amounts yearly to £4,168,000. It is undoubtedly true, that on the existence of this enormous army, depends English supremacy in India, and that if it were withdrawn for ever so short a time, the country would have to be conquered over again. How little the British rulers trust the native princes may be judged from the fact, that in the early part of 1878 when a war with Russia seemed imminent, the reduction of the armies of these princes was seriously considered. Their total amounts to 320,000 men, with 3,500 guns. The very moderate "Bombay Gazette" says plainly; "The Armies of the the native princes are undoubtedly a great danger to British power in India."

Under these circumstances it cannot be wondered at, that all Indian statesmen on returning home hold pessimist views. Rawlinson, the chief authority on Indian matters, says openly, that in India, England is seated on a volcano, that may at any moment burst forth, and annihilate her rule. With her dominion in India resting on such a foundation, it is easy to understand, why England will not have any European neighbour on her frontier, and least of all Russia, with her keen eye for the weak points of other nations, her energetic power of expansion, her still incomplete programme, and her universally military tendencies.

A collision between Russia and England on Central Asian territory has twice been imminent: at the end of the last century, when Napoleon I. in concert with Russia planned an invasion of the East Indies; and again in the 30th year of this century, when Russia and the Porte in the famous treaty of Chunkiar Iskelesi (8 July 1833) made an offensive, and defensive alliance, to secure the integrity of their protected provinces, and the Porte further pledged itself, at the demand of Russia to close the Dardanelles to any power hostile to the Russians. As is well known, England, and France protested strongly against the conclusion of this treaty, but the Porte held, that she had the right

over the Dardanelles, and could close it to whom she pleased. After that the breach between England, and Russia became still wider in the East. On the one hand England assisted the Caucasians "the guardians of her Indian Kingdom" with arms, ammunition, and money, in their campaign against Russia; on the other hand, the Russians drew up a bold scheme for seizing the East Indies, which however was frustrated by the powerful action of the Governor General, Lord Auckland. In 1838 Russia made the first attempt, to enter into an alliance with Afghanistan, with the avowed purpose of obtaining easy access to India; and when the British Governor General of India had ascertained, that the then Amīr of Afghanistan, Dost Mohammed, had received assistance in money from Russia, and was endeavouring to gain over the rulers of Sind, in the conflict about Herat, which had been invaded by the Persians, he, on the 1st October 1838, declared war against Afghanistan.

"The welfare of the English possessions in the East," it was said in the proclamation, rendered it necessary to have an ally, on their western frontier, who would be in favor of peace, and opposed to all disorders, and innovations." The Government desired therefore to place Shah Shujah-ul-Mulk again on the throne of his fathers.

The history of this war is so instructive, that it may be useful to give a slight sketch of it here. The preparations in India were on a scale, which should, even in the event of having a Russo-Persian army to oppose, have made the result a certainty. The strength of the British expeditionary force was 27,000 European, and native troops, with 50,000 followers, and 60,000 camels. This force set out in two columns, one from Bengal, and the other from Bombay by the Indus. En route, Sind which had hitherto been independent, like the Punjaub, and Lahore, was subjugated, and 9,000 men left behind to occupy it.

On the 23rd February 1839 a simultaneous advance from Shikarpur on the Bolan pass commenced. On the 25th April Kandahar, on the 23rd July Ghuzni, and on the 6th August Kabul, were reached, and Shah Shujah set on the throne. By the following September the British considered the power of their protégé so well established, that they withdrew most of their army to India. Only five regiments of infantry, and one of cavalry remained in Afghanistan, where suspicious symptoms of discontent, and dissatisfaction with the new order of things, began very soon to show themselves. During the summer of 1840 insurrections had to be put down by force in several places, and on the 2nd November of the same year, Dost Mohammed completely defeated the English in the Perwan Pass. From that time till the autumn of 1841 a sultry calm reigned in the country.

The English Commanders, though they were fully aware of the state of mind of the people, neglected to take the most simple measures of precaution. Towards the end of 1841 signs of the great conspiracy of which Akbar Khan, Dost Mohammed's son, was the soul, became visible.

Here and there insurrections broke out, numerous chiefs left Kabul, and assembled their followers in the Khurd Kabul Pass, two german miles from the city, and by taking up this position completely cut the English off from India. A body of troops sent to clear the pass forced their way through with considerable loss, and reached Jellalabad, where they fortified themselves. Finally on the 2nd November, with winter coming on, and when assistance from India was impossible, all the chiefs implicated in the conspiracy suddenly rose, the houses of the English were stormed, and destroyed, and their wives and children dishonored, and murdered with impunity. At the same time, the Afghan mountain regiments in Kodara killed their European officers; and all the infantry, and cavalry regiments, that had been raised by the English in Afghanistan, joined the movement. Shah Shujah, although he had from the first worked eagerly for the destruction of his patrons, was thrust from his throne. The British, who were now in the direst distress, and beset by all the horrors of hunger, and want, resolved to seize Akbar; but the troops ordered to the attack fled back into camp. After that the fate of the whole Army, which still numbered 6,000 fighting men with 12,000 followers, who might all have been armed, was sealed.

Instead of cutting their way through sword in hand, the disheartened officers in command hoped to ensure their safety by negotiations, and parleyings.

Even when Macnaughton the British envoy was murdered in the sight of the troops, the leaders declared that this accident in no way affected the agreement, by which Akbar himself was to accompany the withdrawing troops, and provide for their safety, and maintenance. The British gladly paid the stipulated sum, gave the required hostages, presented the Afghans with the guns, and distributed money amongst the servants.

Their departure, which had been fixed for Christmas Day, was however repeatedly postponed, the Afghans wishing for delay, before reaching the mountains, in order to ensure the destruction of the British, who would thus be exhausted by cold, and hunger. At last on the 6th January 1842, they were given permission to leave their cantonments. They travelled by the Khurd Kabul, in order to reach the Indus through the Khyber pass. It was a retreat of which the horrors can only be compared to the campaign of 1812. The extreme cold, hunger, and the cruelty of the Afghans, destroyed within a week the whole army except a few prisoners. One single Englishman, Dr. Bryden, managed to escape in some marvellous manner, and reached Jellalabad, which was occupied by General Sale.

On receipt of the news of this overwhelming catastrophe, the Indian Government endeavoured to rescue the garrisons of Kandahar, and Ghuzni, as well as that of Jellalabad; but the Mahomedan troops refused to march against their co-religionists, and the Sikhs also

showed great unwillingness. The idea of attempting to force the Khyber had therefore to be given up.

The garrison of Ghuzni thinking to secure their safety by capitulation, were cut to pieces, (March 1842). Jellalabad, held by 2400 men under General Sale still withstood the storm like a rock of iron. At last General Nott the energetic officer commanding at Kandahar, on receiving the news of the destruction of the British army, blew up the citadel of the town, destroyed all the supplies he could not take with him, and started on the 8th August 1842 for Ghuzni. On the 6th September he reached that thriving city and destroyed it.

In the meantime the British Government had collected 12,000 troops, at Peshawar, and placed them under the command of General Pollock.

Having by payment of heavy sums secured free transit through the Khyber, Pollock advanced, and having relieved Jellalabad, he marched on Kabul, and joined Nott there on the 16th September.

These avengers exacted ample retribution for the atrocities, which had been perpetrated. Kabul, and other towns were levelled with the ground; Akbar's troops were blown from guns; and the people were collected together, and destroyed like worms. By the middle of December, the British had started on their return march, pursued as far as the Indus by the Afghans, and by this hurried conclusion to the war, lessened their prestige in Asia to an enormous degree.

"It was not so much the fact of our retreat from Afghanistan," says Rawlinson, "as the way in which it was carried out, that so grievously injured our position in Central Asia. Had we but remained a year in the country, and after securing the passes, had we then made an orderly, and honorable retirement, the bad effects of our previous disaster would have been diminished, if not altogether overcome, but retreating as we did, pursued even through the last pass into the plains by an implacable enemy, the impression became universal in India, as well as in Central Asia, that we had simply been driven back across the mountains."

From 1842 to 1855, in which year Dost Mohammed was reconciled with the British Government by the payment of subsidies, and presents of arms, very little political intercourse was held with Afghanistan. During the civil war, which raged in that country after Dost Mohammed's death in 1863, the aspect of things again became threatening, England maintaining a hostile observant attitude. This drew on her the mistrust and dislike of the final conqueror Shere Ali. Repeated presents of arms, treasure, and money, and the continual advance of Russia, brought about however, from 1869 to 1873, a temporary improvement in their relations.

In 1846 Russia had erected forts (Orenburgskoji and Uralskoji) on the Irgis and Turgai, and in 1847 Kamskoji on the Sir Daria. At this

time her boundaries were beyond the Ili as far as the Alatan-Rucken and along the rivers Tshu and Sir Daria. But soon after she crossed the Tshu with the view of obtaining a natural frontier by taking Alatan, Boroldai and Karatan from the Khirgise. In 1853 she took possession of the Sir Daria as far as Akmesjid, in 1855 founded colonies on the Ili, in 1860 took Tokmak and Pishpek, and during the course of the next eight years going on from conquest to conquest had extended her dominion into the Khanate of Bokhara. In 1871 followed her annexation of Kuldja by which a wedge was driven in between the Mongols and East Turkistan; and finally in 1873, after her expedition to Khiva, she had extended her boundaries to the Amu Daria.

The Amir of Afghanistan, uneasy at the seizure of Khiva by the Russians, sent a special embassy to Simla to Lord Northbrook, asking how far he might reckon on England for protection against Russia. Lord Northbrook replied, that the Indian Government would assist him on certain conditions, one of which was, that he was not to act on the offensive or provoke hostilities. But Lord Northbrook's action was not approved of by the Gladstone cabinet, who, being the quintessence of the Manchester party, considered it essential to keep on friendly terms with Russia; and Russia, who was digesting her conquests, agreed in these sentiments, and joined England in defining the northern boundary of Afghanistan, 1872-73.

The Viceroy's final reply to Shere Ali was, that the question had better be postponed to a more convenient season. This unsatisfactory explanation affronted the Amir, and he declined to take any notice of Lord Northbrook's request, that a British Officer should be sent to examine the northern frontier of Afghanistan; he also refused to allow Sir D. Forsyth's mission to Kashgar, to return through his dominions.

In 1874 Disraeli's ministry came into power, and at once saw the necessity for bringing the Amir into friendly relations. Lord Lytton who had been appointed Viceroy opened negotiations, which were however very sulkily received. The Amir declined to consider the question of receiving a British embassy, though after some time he agreed to send Syud Mohammed Khan to Peshawur, to confer with Sir L. Pelly; however as this ambassador died almost immediately, Shere Ali declared the negotiations should no longer be carried on.

On the 23rd June when the friendly relations between England and Russia had become seriously compromised, he received a Russian embassy with great pomp, and ceremony. On this Lord Lytton informed the Amir, that the British Government had likewise decided to send a powerful mission to Kabul, under Sir N. Chamberlain; the Amir in an evasive reply refused to receive the mission, and instructed the Commandant of Ali Musjid to oppose its entrance into the district under his command. On the 21st September therefore, this officer threatened to prevent by force its further advance. Sir N. Chamber-

lain was in consequence obliged to return to Peshawur with his object unattained.

Lord Lytton is reported at this juncture to have desired immediate action, but the English Government, with a view of giving the Amir one more chance of peace, instructed the Viceroy to send an ultimatum, in which a full apology, and the reception of a permanent mission were demanded.

As the term granted to the Amir of Afghanistan to reply to the ultimatum of the Government of India had expired at midnight on the 20th November, without Shere Ali's having replied to it, the immediate advance of the British Columns was ordered from England, and the independent management of the whole affair was transferred to the Government of India.

On this the Viceroy issued a proclamation, and on the 21st November war was declared, and a simultaneous advance made by the British Columns.

THE OBJECTIVE.

The territory of Afghanistan is somewhat larger than the Austro-Hungarian Kingdom ; it amounts to 12,000 square miles, with a diameter of 688 miles from north to south, and of 736 from east to west.

Afghanistan is a mountainous country, a high plateau of about 1900 metres above the sea overlooked by lofty mountain ranges, which open out, and sink towards the west and south. It is bounded to the north, by the western ranges of the Himalayas, which reach to the Amu Daria ; by the wall-like range of the Hindu Kush, some of whose peaks are 6000 metres high, (19,000 feet) by the Koh-i-Baba, Siah Koh, Ghur, Kuto-Kaitu, &c. Between the Kabul and Kuram rivers rises the snow capped Sufed Koh, of which the principal peak, to the south west of Jellalabad, attains a height of 4,760 ^{ms.} To the south of this, in southern Afghanistan, the Suliman range of an average height of 3000 ^{ms.} falls rapidly towards the valley of the Indus. Between the Hindu Kush, and the Suliman range, there are several lesser ones stretching in a parallel direction towards the south west. The most remarkable are the Amran Mountains, 2,590 ^{ms.} high.

The country is well watered throughout, but the rivers are like wild children of the mountains, and cannot be made of much use commercially. The chief ones are the Har-i-Rud, the Helmand, the Kabul, the Kuram, and the Gomal.

Afghanistan is chiefly a high barren plateau, from which the numerous flocks can get but scanty pasturage. Rich vegetation is only found in the valleys.

The means of communication are very limited. There is only one high road, which goes from Herat to Kandahar, and thence by Ghuzni to Kabul, this is the "Royal Road" marked out by Alexander the Great, when he undertook an expedition to India.

The population is from 4 to 6 millions, chiefly of Persian, the remainder of Tartar extraction, and are Sunni Mahommedans; they are a nomadic race. The few towns are Kabul with 60,000, Kandahar with 50,000, and Herat with 100,000 inhabitants.

The country consists of three separate states, Kabul, Kandahar, and Herat; and the government has hardly yet learnt the elements of political organisation; the sentiments of patriotism, and any feeling of common, and united interests are unknown to this wandering, and dis-united race; and the bond, which unites them to the central power, is a very loose one.

The public revenue amounts yearly to about five million gulden of money, and of tribute levied in kind, from the natural products of the country; this reaches to a much higher value than the money tax.

The regular army is composed of from 18, to 20,000 men; the irregulars amount to 60, or 80,000. This latter number however depends entirely on the Chieftains, and their willingness to let their followers serve in the army.

The above is a rough sketch of the features, and constitution of the country, against which the policy of Great Britain determined it to make war in November 1878. An extensive territory, wild, sparsely populated, and poor in resources, without organisation, and with a Government not national, but dependent on the ruler, who may happen to be in power.

THE PLAN OF CAMPAIGN.

England's war against Afghanistan is an offensive one, undertaken for certain limited aims, i.e., the chastisement, not the annihilation, of the country for the hostile attitude it had taken up towards the English Government, and the acquisition of certain strategical points, by the possession of which, the western frontier of India would be militarily strengthened. These objects will only be attained when, the Amir's troops having been vanquished, Kabul in the north, and Kandahar in the south, are in the possession of the British forces.

In her attack on Afghanistan, England has India as her base, a civilised country, well supplied with all military requisites. Her army is in all essentials organised, armed, and commanded on European principles. It is of course therefore tactically superior to that of the Amir, and also numerically, as far as can be approximately ascertained. The English have also the advantage of acting on the offensive, though

from the necessity of such an enormous following, this advantage has been much weakened. On the whole the superiority of the English is such, that no doubt should remain as to the ultimate result.

The Afghan people, occupied with the defence of their homes have failed to assist the Amir in the formation, and maintenance of that indispensable instrument, an organised, well-equipped, easily mobilised army. In a regular battle the Afghans can have but little hope of success; their strength lies in the petty warfare natural to them in their wild, mountainous, and, in the winter, dangerous country. Their tactics are therefore to divide the English army, by repeated attacks in the rear, and flanks.

In planning their campaign, as must always be the case in an offensive war, the English had to consider three main points;

- 1st. The strength, and organisation of the force.
- 2nd. The position of the base, and points of concentration.
- 3rd. The direction of the advance.

The first point leads us at once to the consideration of their military strength.

The Anglo-Indian Government disposes of the following forces :

1st. the troops sent from England, and periodically relieved, amounting to 62,652 men : 2nd. the regular native army, *i.e.*, the Madras, Bombay and Bengal troops, 130,000 men, 3rd. the irregular native troops.

As the European troops sent to the East Indies, as above stated, are solely for the purpose of protecting the British dominions in Asia, they can take, but a small part in any trans-frontier operations. We will therefore only consider the native troops, of which any army fighting out of India, must be principally composed.

The native army is formed by enlistment for a period of three years' service. Since the mutiny in 1857-58 no natives are allowed to serve in the artillery, except in some mountain batteries, intended for frontier service.

The lower grade of officers is open to natives. This system of native officering is, according to recent opinions in the Indian military forces, considered costly, dangerous and worthless; and great complaints are made of the deficiency of British officers.

The English regiments are fully equipped with Martini—Henry rifles, but the Native ones are, with few exceptions, armed with sniders, and, as a matter of precaution, allowed a very limited quantity of ammunition.

The usefulness of these native troops in warfare is very much impaired by the enormous amount of baggage, and followers, allowed by the regulations, and necessitated by their religions. The registrar of the Staff at Berlin 1877 reports on this subject as follows:

“At present the regulation number of these followers &c. for a cavalry regiment consisting of 9 European, and 13 Native officers, and 450 non-commissioned officers, and men, amounts to 322 mules, and 590 servants, cooks, grooms and muleteers; for a Native Infantry regiment of 9 European, and 16 native officers, and 736 non-commissioned officers, and men, 350 mules, and 400 servants, camp followers &c.”

Opinions as to the value of these native troops are strikingly unanimous. The *Times* in 1874 says; “what we understand by the Native Army, is a body of men unable to withstand the fatigues, and hardships of the shortest campaign; its organisation is thoroughly rotten, the officers are spiritless and discontented, and the men take no pleasure in the service; the recruiting system is such that were an insurrection to break out in one regiment, we should be powerless to confine it to that one, and the whole army would be infected.” In Russian reports it is asserted, that in 1876 no less than 7,759 men (or nearly six per cent.) deserted from the native regiments; these figures are not so surprising, when we remember that, from the comparatively small army of the Mother country, over 8,000 men deserted in 1876, and 7,500 in 1877.

From this Anglo-Indian Army 34,730 men, of whom 12,740 were Europeans, were assembled for the operations against Afghanistan. The relative numbers answer pretty nearly to the proportions existing between the European, and Native troops, that is 62,652: 130,000. To these we may add the reserves, up to the present raised, and brought on the effective fighting strength, when the total will be about 40,000 men.

This is the largest force, that England has ever collected together for active service beyond the frontier, and is the utmost limit of her Anglo-Indian military capabilities. It would be altogether inadequate, should Afghanistan receive assistance from Russia.

Even supposing however that England could place a much larger force in the field, two important considerations must be kept in view, which would lead to a rapid diminution of the invading army; 1st. Afghanistan is a thinly populated country, without natural resources, and 2nd. the Anglo-Indian army is one of the most extravagant in its requirements in the world. From the mountainous character of the country, the use of wheeled carriage is altogether out of the question, and this of course (as all supplies must be imported) complicates matters, and much increases the difficulties of transport arrangements.

These considerations also affect the organisation of the force, the rough mountainous country reduces the necessity for cavalry, and artillery

and requires "specialités" in these branches of the service, the importance of the infantry being at the same time much increased.

It also necessitates the formation of numerous small self-contained units, with separate corresponding establishments.

This explains to us the numerous, but weak Brigades, and Divisions.

The point of concentration and basis of operations is the Indus valley. It was considered suitable, both on economical, and strategical grounds; it is richly productive, well populated, and prosperous; its most important points are Peshawur, Attock, Lahore, Multan, Shikarpur and Kurrachi; commerce is in a thriving condition, and numerous agricultural highways run from the terminus of the railway from Calcutta. The railway, and the navigable Indus connect all these points with one another, and the principal ones form a good line of defence, which is protected on one side by the Himalayas, and on the other by the sea.

The Indus valley is protected from Afghanistan by a line of posts, which are, from north, to south as follows: Jumrood, Bara, Mackeson, Michni, Shub Kadar, Abazai and Kohat: also by fortified posts connected by military roads: Thull, Bunnoo, and Doaba.

From the Indus valley into the interior of Afghanistan there are only four lines of communication, which can be called military roads; 1st. From Peshawur through the Khyber pass to Kalul; 2nd. From Thull over the Peiwar and Shuturgurda passes to Kabul; 3rd. From Dera Ismail Khan (formerly Mandshigurh) through the Ghuleir Surwandi and Sargo—passes to Ghuzni; 4th. From Shikarpur by Quetta to Kandahar, and thence on to Herat, or by Ghuzni to Kabul.

Besides these, there are about fifty steep difficult mule tracks over the bleak, barren Suliman range, which on its eastern side is very precipitous, and which from its nature is an impassable barrier against any large body of troops.

By which of these lines should the English have advanced?

In such an impracticable country, every line of communication is of military value, and England's object being, without doubt, occupation, she resolved to make use of all four, but found that for this she had not the necessary force. The least direct one, from Dera Ismail Khan by Ghuleri to Ghuzni, was therefore abandoned. In the north therefore there only remained two roads to Kabul, the capital of the country, which could be considered fit for military purposes, and between these the ranges of the Safed Koh and the Ghur mountains (360 ^{ms.}/_{ms.}) formed an impassable barrier. Although the simultaneous use of both necessitated the division of the force, it did the same with regard to the enemy,

but that from such a course danger would ensue was evident to the meanest military capacity. The use of both roads was determined on, not only because both led to the most important passes from India, but because a division of the force made the commissariat arrangements easier, and by concentrating two considerable forces in the Punjab, the most dangerous part of India, the Government hoped to impress and awe the people of that volcanic country.

The 4th line led to Kandahar, a point of great strategical importance, and thence to both Herat, and Kabul. The possession of this line had already become an important consideration, on account of Quetta, which was placed like an island beyond British territory; it became therefore a necessary part of the plan of operations. The military value of this line lay in the fact, that between Quetta, and Kandahar, it offered fewer and less important difficulties than the more northern ones, that it runs through the most fertile parts of Afghanistan, and that, going by Ghuzni to Kabul, the holders of the north eastern passes can be taken in rear.

Of the selected routes, the one from Peshawur through Jellalabad to Kabul is the most important, the Kuram line is of less consequence, and these considerations regulated the division of the force, which was disposed somewhat in the proportions of: 3: 1: 2 and, on the 20th November 1878 was formed into six Divisions as follows:

The principal column under General Sir Sam. Browne was placed on the Peshawur—Jumrood line. It had to advance through the Khyber to Jellalabad.

A second column under General Maude acted as reserve, and support to General Browne.

A third was assembled at Thull under General Roberts, and was to operate in the Kuram valley.

A fourth under General Biddulph, already assembled at Quetta in Biluchistan, was to advance on Kandahar.

A fifth under General D. Stewart, formed at Multan, was to follow the 4th through the Bolan Pass to Quetta.

A sixth under General Primrose was to assemble on the lower Indus, as a reserve.

The whole army was under the supreme command of General Frederick Haines, who remained with the Viceroy at Lahore.

THE OPERATIONS.

QUETTA COLUMN.

The fact that this column met with little or no opposition during its march, makes it unnecessary to treat of it at any length. The

force consisted of 11,590 fighting men, of whom 3,380 were Europeans, it was divided into two commands: 1st Division, General Biddulph at Quetta, 2nd General Stewart, who started from Multan, on the 19th November, and reached Quetta on the 8th December. His division marched 467 Km. in 20 days, and crossed the Bolan Pass without being attacked.

On the 31st December Biddulph crossed the Khojuk—and Stewart the Gwaja—passes. On the 6th January when near Kandahar their advance cavalry was attacked by a force of Afghans, who were scattered, and defeated with a loss of only 11 wounded; of the Afghans 20 were killed, 9 made prisoners, and 1,200 surrendered; 20 guns fell into the hands of the English. The two columns joined at Takht-i-pul, and marched to Kandahar on the 8th January, and on the 11th the place was occupied without opposition.

On the 15th Stewart sent Primrose forward as far as Khelat-i-Ghilzai, and on the 16th Biddulph went to Girishk, to protect his left flank. They had already reached their destinations, the former on the 20th the latter on the 29th, when they were ordered back to Kandahar.

This was apparently caused by climatic considerations, and difficulties of supply.

THE KURAM COLUMN.

The line of Operations of No. 3 Column under Major General Roberts extended from Thull, a fortified British frontier post, to about 40 miles into the Kuram valley, and then, inclining towards the west, on to the Kuram Fort (Mahommed Azim's) a walled quadrangular fortress, with flanking towers (6000 feet above the sea). The Kuram valley is, up to this point, well cultivated, and productive; wood, water and forage are easily obtained, and the climate is very healthy. Winter only lasts with any severity for six weeks, and the spring, and autumn are delightful.

A short distance beyond the Fort commences the ascent towards the Peiwar Pass, 38 ^{Kms.} distant (8000 feet high). The road, thickly bordered with cedar, and pine trees, is covered with boulders, and is excessively difficult; the villages, through which it passes, are chiefly composed of fortified houses, protected by watch towers, and from the village of Peiwar, it leads through a winding defile to the top of the Pass; here the road is confined by perpendicular chalk rocks, the summits of which are covered with cedars, pines, and firs, and a luxuriant growth of laurels. On the further side of the pass, the road ascends to the heights of the Hazardarakht, which is covered with snow in winter, and then climbs to the Shuturgurdan pass (3,500 ^{ms.}), reaching a plateau, on which the snow lies for 6 months in the year; from thence it descends into the fertile Logar Valley, and reaches

Aktonkhel, which is only 82 $\frac{\text{Kms.}}{''}$ from Kabul. The total length of this line is from 249 $\frac{\text{Kms.}}{''}$ to 310 $\frac{\text{Kms.}}{''}$

Robert's force of 5,776 men (1,816 Europeans), crossed the Kuram river on the 21st November. and took possession of Forts Kapatanga and Kaion without opposition; one of his reconnoitring parties had a skirmish with some Afghan irregulars about 10 miles beyond the frontier. On the 22nd he reached Kazarpsis, and Fort Amedshama, crossed the Durwaza Pass on the 27th, and on the same day occupied Kuram Fort. the possession of which secured the Peiwar Pass.

The natives had so far been friendly, and had brought in supplies. The Turi—and Jagi—Sunis, warlike mountain tribes, who since Lord Clydes' time had received a subsidy from the British, offered to assist as guides.

On the 28th, Roberts with two infantry brigades, four field batteries one mountain, and one elephant battery, arrived at Habib Kila, and remained till the 29th at the entrance of the defile. During the night of the 29th, the Turis and Jagis suddenly left the British camp, and the five troops of the 12th Bengal Cavalry, who were sent after them, were received with musket shots.

On the morning of the 30th, Roberts resumed his march, with Cobbe's brigade in advance, and reached the top of the dangerous ascent, to the Peiwar pass. Enormous pieces of rock appeared to have been recently placed on the track, for the purpose of impeding the advance, and in various commanding positions posts of observation had been run up, and stone batteries erected. As soon as the hindrances had been cleared away by the Bengal Sappers, and Miners, the column advanced in the following order: the front protected by the British Cavalry, and Bengal Lancers, and the right flank by the 5th Goorkhas: the 12-pounder battery, 4 mountain guns, the Cavalry, 8th British Infantry, 3rd Bengal Regiment, and the 20th Punjab Infantry.

The troops protecting the flank had very soon to be called in, as the sides of the defile became absolutely inaccessible. No sooner had they passed Habib Kila, than the whole country seemed alive; on the heights armed men were concealed in every direction, and shortly afterwards the Afghan artillery opened fire. It became evident, that the British had enemies also in their rear, huge masses of rock being rolled down into the valley, a retreat was ordered by General Cobbe; and they retired covered by the Peshawar mountain battery, and the Goorkhas. They were pursued by the enemy's fire, and surrounded by Turis, and Ghilzaies but managed to reach the opening of the defile with a loss of one killed, and six wounded. Roberts halted at the entrance of the defile, being necessarily compelled to await the arrival of his reserve brigade, 2,500 strong. It arrived on the 1st December, having come over Hazirpir and Durwaza pass. The weather was fine though cold, and the health, and

the spirit of the troops good. It was ascertained by a reconnaissance, that the Peiwar pass was strongly occupied by Afghans, and defended by 12 guns, and that such a weak force as Robert's could not hope to carry it by a front attack. It was found however, that by turning the enemy's left flank, and following the dry bed of a torrent, a practicable road existed, though extremely difficult, and about 15 ^{Kms.} longer. By this track, Roberts ordered the 5th Goorkhas, 29th Punjab Infantry, No. 2 mountain battery, under Colonel Gordon; and the 72nd Highlanders, 2nd Punjab Infantry, the 23rd Pioneers, and 4 field guns under Brigadier General Thelwall, to start at 10 P.M. on the 1st December, and to march all night.

He left the 5th Punjab Infantry, the 2-8th Foot, 12th Bengal cavalry, and 5 guns, under General Cobbe, at the entrance of the pass, with orders to attack the Afghans in front, on the morning of the 2nd.

At 6-15 A.M. on the 2nd, the 5th Goorkhas surprised the Afghan outposts, and with the 72nd Highlanders stormed one of their barricades. A mountain battery then came up into position, and after two hour's fighting, the enemy's left wing was broken up, and put to flight.

An attack made at the same time by the 29th Native Infantry on the enemy's centre, which was in a thick pine forest, was repulsed, and in a second advance, they were again driven back, although assisted by the 5th Goorkhas, and the 72nd Highlanders and although four guns from the rear had opened fire. The Afghans repeatedly assumed the offensive, constantly bringing fresh troops up to the front.

The English troops had now (1 P.M.) been for fifteen hours on end either marching, or fighting, and were utterly exhausted, Roberts therefore let them rest, and refresh themselves, protected by the 2nd Punjab Infantry.

Meantime he decided to turn the enemy's centre, and at 3 P.M. gave the order, selecting the 29th Punjab Infantry, the 23rd Pioneers, and the elephant battery for the work; this manoeuvre which was ended by 5-30 was thoroughly successful and decisive.

Meanwhile the 5th Punjab Infantry had, at 9 A.M., occupied the height to the left of the enemy's centre, and with two guns kept up an active fire on the pass; at 3 P.M. the 2-8th Foot had taken possession of the pass, and when at 4 P.M. the left wing had taken the Kotal, the whole of the enemy's line was in the hands of the English. The Afghans made a hasty retreat, or rather flight, leaving behind all their guns (18), ammunition, and supplies.

The 12th Bengal Cavalry started in pursuit, but had to give it up owing to the darkness, the exhaustion of the troops, and the difficulties of the ground.

Roberts' troops were thoroughly worn out, they had almost come to the end of their ammunition, and had no supplies: considering the number of the enemy, and the strength of their position, the British losses were very moderate; 2 officers, and 25 men killed, and 2 officers, and 70 men wounded.

They bivouacked that night at a height of 9,000 feet above the sea, and suffered severely from the bitter cold.

Roberts having strengthened the positions on the Peiwar Pass, and made arrangements for hutting a portion of his troops, he himself started for Alikheyl (7,500 feet), reaching it on the 6th, from thence he pushed forward Thelwall's Brigade, as far as the foot of Shuturgurda; as no snow had yet fallen the pass was still practicable, a fall however was momentarily expected, which would have cut off his communication with the base.

The cold here reached 150° R. and a great number of English soldiers, and two thirds of the natives were in consequence rendered unfit for service; scurvy had broken out amongst the Goorkhas, and the rest of the troops suffered from violent bleedings from the nose, and the ears; during the night of the 14th seven men of the 23rd Pioneers who were working at the entrenchments were frozen to death; the 72nd Highlanders were the only ones, who escaped injury from the severity of the weather.

Roberts therefore saw the necessity of removing his camp from Alikheyl, and returning to Kuram; he left Colonel Gordon behind with the 72nd Highlanders, and 23rd Pioneers, encamped at Kuraja at the foot of the pass. Communication between the two was kept open by occupying twenty partly new, and partly adapted block-houses, and increasing their garrisons from twenty men to one company; and the road was constantly patrolled by light and heavy cavalry. In addition to this, the Ghilzais undertook the protection and clearing of the road, and supplied escorts for the convoys, as far the boundary of their country; and they offered to give hostages as security for this agreement being carried out. The Mongol tribe, on the contrary, held aloof with evident hostility, and on the 16th December, they suddenly emerged from the eastern debouchés of the Sapri pass about five miles from Kuraja and attacked a company of the 5th Goorkhas, who were escorting a convoy of supplies; these would have been destroyed, had not Roberts at once sent to their assistance, a half battalion of the 72nd Highlanders and two companies of the Pioneers.

Herewith the preliminary operations of Roberts' Corps came to a conclusion.

At the beginning of the new year, he made an expedition into the province of Khost, to compel the Governor Mohammed Akram Khan to capitulate, and give up fort Mattoon; his flanks however being

threatened by Mongols, he was obliged to return to Kuram, and concentrate his force.

THE PESHAWUR COLUMN.

The route of No. 2 corps led from the railway terminus at Jhelum, by Peshawur, and Jellalabad, to the end and the aim of the campaign—Kabul;—its length was about 309 $\frac{\text{Kms.}}{''}$.

From Peshawur (555 $\frac{\text{ms.}}{''}$ above the level of the sea) the road gradually rises, and after 10 $\frac{\text{Kms.}}{''}$ reaches Jumrood (509 $\frac{\text{ms.}}{''}$ above sea level), and 65 $\frac{\text{Kms.}}{''}$ further to the west, passes through the great Khyber pass. This Pass 56. $\frac{\text{Kms.}}{''}$ long, can however be turned by going to the north, through the Abkana—and Tartara—passes; they are not practicable for wheeled traffic, or baggage animals, and the first part of the road along the Kabul river is excessively difficult, and narrow being closed in by precipitous cliffs.

As far as fort Ali Musjid, the Khyber pass is a narrow defile between perpendicular slate rocks, 450 $\frac{\text{ms.}}{''}$ high; beyond that fort the road becomes still more difficult, and in some of the narrowest parts, along the rocky beds of torrents, it is not more than 14 $\frac{\text{ms.}}{''}$ or 16 $\frac{\text{ms.}}{''}$ wide. Five miles further on, it passes through the valley of Lalabeg (2.5 $\frac{\text{Kms.}}{''}$ wide 9.6 $\frac{\text{Kms.}}{''}$ long), and then after rising for 6 $\frac{\text{Kms.}}{''}$ it reaches the top of the pass, which from both sides offer very strong, strategical positions. From thence it descends for 4 $\frac{\text{Kms.}}{''}$ to the village of Lundi Khana (758 $\frac{\text{ms.}}{''}$), which lies in a gorge about a quarter of a mile wide; then on to Dakka, (609 $\frac{\text{ms.}}{''}$) This Pass (30 $\frac{\text{ms.}}{''}$ to 70 $\frac{\text{ms.}}{''}$ wide, and 18 $\frac{\text{ms.}}{''}$ long) is shut in by steep, but not high slopes, overgrown with bushes.

On the 18 $\frac{\text{Kms.}}{''}$ march from Dakka to Hazarnao the Khurd Khyber is passed, a deep ravine about 1.5 $\frac{\text{Kms.}}{''}$ long, and in many places so narrow, that two horsemen cannot pass each other. Hazarnao is well cultivated, and rich in fodder; 24 $\frac{\text{Kms.}}{''}$ further on is Chardeh (555 $\frac{\text{ms.}}{''}$ above sea level), and then the road passes first through a well cultivated country, and then through the desert of Surkh Denkor (582 $\frac{\text{ms.}}{''}$ above sea level), which is only 14 $\frac{\text{Kms.}}{''}$ from Jellalabad. This city is, according to Hough, "a dirty group of mud walls, round towers, and narrow streets, with a population of 2,000." From thence as far as Gandamak the route presents no great difficulties, it passes through orchards, vineyards, and corn fields to the Surkhhab river; but beyond this, three spurs of the Safed Koh range, running in a north eastern direction, have to be crossed.

Between Jellalabad and Kabul, two roads can be followed; the first crosses the range over the Kar Kacha pass (2,438 ^{ms} above sea level), at the exit of which is Assin Kila, passes through the Kotul defile and ascending the Khurd Kabul (2,276 ^{ms} above sea level) to the north, reaches the high plateau on which Kabul is situated: the other leads over the short, but dangerous Jagdallak pass to Jagdaliak, from whence there are three roads to Kabul, the northernmost over the Khinar, and the third over the Sokhta passes; all these, which are more difficult than the Khyber, are impassable during the winter; it was here, as has been already related, that the English in their retreat in 1842 were so nearly destroyed.

The disadvantages of this line of march are:

- 1st. In the depth of winter, it is not practicable throughout;
- 2nd. It is so constantly the scene of petty warfare, that it would be almost impossible to make it safe;
- 3rd. There is little or no fuel;
- 4th. It is so poor, and unproductive, that troops are entirely dependent on their Commissariat stores.

The strength of the corps, ordered to operate from Peshawur on this line, was 16,364, (7,544 Europeans); 6,500 men had already on the 20th November been placed at Jumrood, and the remainder, Maude's division, were still assembling between Attock, and Peshawur.

After the departure of the principal column under General Browne the 2nd Brigade, under General Tytler, was to start at 5 P.M. on the 20th November, to go by Lashora to Kata Kushtia in the Khyber, about 2½ miles beyond Ali Musjid, and by occupying this position cut the enemy's retreat.

The 1st Brigade (Colonel Macpherson) was to leave Jumrood at midnight on the 20th, and seize the Rhotas hills, which are 5,000 feet high and command Ali Musjid, and which it was reported, were to be occupied by 500 Afghans.

Both brigades were to reach their destination at 9 A.M. on the 21st; they took three days' provisions with them on baggage animals. The 3rd. and 4th. Brigades started early on the morning of the 21st, with 21,000 followers, taking the direct route to Ali Musjid.

After some slight skirmishes with the Afghan outposts, they reached the Shagai pass about midday, from whence Ali Musjid is plainly visible. Firing having commenced from the Fort, the British Royal Horse artillery on the right, and later (1 P.M.) the 9-pounder and elephant battery (40-pounders) on the left, opened fire.

Under cover of artillery the British Infantry advanced, firing rapidly, against the enemy, who concealing, and sheltering themselves amongst the rocks, easily avoided the shots; the 3rd Brigade was now within storming distance of the Fort, but as the Afghans were constantly unmasking fresh guns, and as the turning columns had still not come into action, and as darkness was coming on, the firing was stopped, and the conclusion postponed till the following day, and the Afghans, not one of whose guns had been disabled, ceased firing likewise. The troops bivouacked on the scene of action, every precaution being taken for their safety.

What had become of the turning columns ?

The 2nd brigade (Tytler) had, after five hours march, reached Lashora at 10 P. M., and there spent the night; they did not dare light fires in spite of the bitter cold, for fear of betraying their position; they started again at daybreak, and reached Panipul at 12-30, exhausted with heat, and want of water; here they discovered that the road to Kata Kushtia was not passable for baggage animals &c. At 2-30 P. M. Tytler sent only the Guides and 1st Sikhs under Colonel Jenkins, on to the Khyber; they reached Kata Kushtia at 4 P. M., and fired at a reconnoitring party of Afghan Cavalry about 50 strong: and as darkness was coming on, also fired at some Afghan infantry, and cavalry, that were crossing the river at Kata Kustia. Tytler with his British regiment arrived at 10 A. M. on the 22nd.

Macpherson was, as has been stated, to start at midnight, and had passed Lashora, and reached Rhotas by midday on the 21st; he crossed the Tortong pass on the night of the 22nd, and joined Tytler on the morning of the 23rd.

The Afghans alarmed by these advancing columns, had in the meantime evacuated the fort during the night, taking most of their dead, and wounded with them; they fled in disorder to Dakka, leaving behind 50 wounded, 22 guns, and mules, ammunition, tents and supplies. Pursued as far as the ground allowed by the 11th Bengal Cavalry, and pressed in flank, and rear by Colonel Tytler, 500 of them were cut off by the Afridis, a tribe friendly to the British, who stripped them not only of their arms, but also, according to the custom of their country, of their clothes. Thus with a loss of only 2 officers, and 40 men killed, and one officer, and 30 to 40 men wounded, the British, after a few hours' fighting, found themselves in possession of this very strong position. According to General Haines' report, the Afghan force was composed of five regular infantry regiments, and a battery of artillery; the British numbered 6,500 men. Browne fortified his newly won position, left the 81st regiment under Colonel J. Browne to occupy it, and marched himself on the 23rd to Lundi Khana.

Major Cavagnari reconnoitred with an advance guard of the 10th Hussars. The prisoners, and inhabitants had reported, that an army of

some 20,000 infantry, and 3,000 Cavalry with 20 guns, under command of the Khan of Kundah, was assembled on the south eastern border of the Dakka plateau. As some of the enemy had been seen at the western entrance to the valley, both sides of the defile were, in spite of enormous difficulties, occupied by a regiment, and a half, as outposts to protect the flanks: they presented an imposing appearance, as they passed through the defile, which is scarcely twenty paces broad, their light guns on camels, and their siege guns drawn by elephants.

On the 24th November, they approached Dakka, advancing with great caution, and after a very difficult march of three hours, the head of the column emerged from the pass, and the 14th Bengal Cavalry occupied the environs of Dakka without opposition, and the troops bivouacked on the plateau. From hour to hour the number of prisoners increased, until by the 25th November it had reached 3000.

The surrounding tribes had so far been friendly, and their chieftains had volunteered their services, notably the Khan of the Mohmunds and at Dakka the Lalpura Khan, a cousin of Yakub Khan, had also made his submission.

In the English camp it was expected, that Kabul would be reached early in December, supposing no unfavorable change should take place in the weather.

The 1st Brigade (Macpherson's) marched towards Jellalabad on the morning of the 1st December.

The advancing force was divided into three columns the principal one, commanded by General Browne himself, moved along the valley of the Kabul river, and the other two, each protecting a flank of the centre one, skirted the valley, meeting with great difficulties by the way. The extreme cold also was already much felt by the native troops.

Major Cavagnari, accompanied by Shah Mohammed the Khan of Lalachena, led the advance guard with a squadron of the 10th Hussars, and about 100 Afridis. His reconnaissance had already marched beyond Jellalabad, when by order of the Commander-in-Chief the advance of the three columns was countermanded, and a return to Dakka ordered.

In the rear of the first column, great uneasiness had suddenly manifested itself.

On the 28th, the telegraph, evidently to prepare the public, announced, that great precautionary measures were being taken, to guard against the dangers to be anticipated in the passes, and on the following day a report was circulated at Lahore, that the whole of the Peshawur column had been cut off and destroyed.

The details of what really happened in rear of the force have not, up to the present time, been satisfactorily explained.

It is certain however, that, between the 28th November and 3rd December the situation was looked upon as very critical, both at the seat of Government, and at the British Head Quarters. The official telegrams, which were of an elaborately reassuring nature, do not in any way alter the facts of the case; the measures taken during this critical period are sufficient, and clear proofs of the danger that existed.

It appears, that the Zukka Khels first rose, a tribe of the Afridis, who until now had always been friendly to the English. The cause of this seems to have been, their being prevented by the British from sacking Lundi Khana and Dukka. At Lahore it was stated, that General Browne had strong proofs, that a European power was concerned in the matter, and that the interference of Russia was not to be mistaken.

The Afridis had taken possession of the heights above the Kabul river valley, and occupied the left side of the Khyber pass, firing at everyone who came within reach.

Armed bands appeared between Jumrood, and Ali Musjid, and on the 29th November the Pass was for the time completely closed. A convoy, which had started, was obliged to return to Jumrood.

Near Ali Musjid, the Afridis attacked a detachment under Major Pearson, but a well directed shell from the fort dispersed, and drove them back; the communications however still remained interrupted. An affair near Lundi Khana was still more serious, and it was not until nightfall, that communication between Browne, and Maude's columns in the pass was re-established. It was found necessary to send back the 2nd company of Rattray's Sikhs under Colonel Buchanan, to assist Macpherson's troops in clearing the pass.

On the 30th November a convoy was stopped, and had to return to Ali Musjid, and the 81st Foot (Lincoln Volunteers) had an indecisive engagement with the Zukka Khels at the entrance of the pass.

Strong parties of Afghans, descending from Jubba, and Akhor, ventured even into British territory, on plundering expeditions; and on the night of the 2nd December there were disturbances in flank and rear, and half the 17th Regiment had to be sent to restore tranquility.

The British at first maintained, that only one tribe had risen, but it is now known, that almost the whole of the hill tribes were in a state of revolt.

The situation however suddenly improved, as by a stroke of magic, and affairs assumed quite a different aspect. British steel, and British gold seem to have had an equal share in this result.

On the 2nd December it was announced at Lahore, that the friendly tribes had undertaken the defence of the Khyber pass, and the unfriendly ones ceased giving trouble. Cavagnari, assisted by the Malikis of the Zukka Khels, punished the tribe, that had attacked the convoy on the 29th; a portion of it submitted, and the rest were dispersed.

On the 2nd December a troop of Horse Artillery was sent from Peshawur to Jumrood, and they with the 5th Fusiliers, under Major Philip Fitz Roy, after some fighting drove the Afghans from the heights, they had occupied above the pass, and the garrisons of Forts Bara and Mackeson were strengthened.

The 2nd Goorkhas left Peshawur on the 3rd, to assist the garrison of Jumrood in dislodging the Afghans from their positions on the Shagai Ridge and the Khyber heights, and on the same day had an encounter near Kata Kushtia, which resulted in clearing the road to Dakka.

From this time not only large convoys, but private individuals, Lord W. Beresford for instance, could pass through the Khyber without danger, or hindrance. The military authorities determined to use every measure to avert the possibility of such another crisis, recalled the Commandant of Ali Musjid, and appointed Colonel MacGregor in his place, with the duty of looking after the arrangements, and safety of transport in the Khyber.

He considered the most effectual means of ensuring this to be to send out detachments for the purpose of punishing, and preventing combined action amongst the neighbouring hill tribes.

The disposition of the principle column was as follows on the 3rd December :

The Head Quarters with General Browne at Dakka; at Bhasawul under Brigadier Generals Macpherson, and Gough, the 10th Hussars $\frac{1}{2}$ Troop Royal Horse artillery, 1 Mountain battery, 4th Battalion Rifle Brigade, and 4th Goorkhas; at Fort Dakka, $\frac{1}{2}$ Troop Royal Horse Artillery, Guides, and first Sikhs. In camp near Dakka, 11th Bengal Cavalry, 1-17th Regiment, 14th Sikhs and 1 Company Sappers and Miners. At Lundi Khana, 20th Punjab Infantry. At Ali Musjid, and Shagai, the 3rd, and 4th Brigades, under Colonel Appleyard. At Jumrood 5th Fusiliers, 1 Troop Royal Horse artillery, and the 2nd Goorkhas, from Maude's Division.

The advance on Jellalabad, which according to authentic intelligence on the 3rd, had been frustrated by the Afghans, was again undertaken on the 4th, no opposition was met with, and on the 20th Browne marched through Jellalabad, at the head of his troops with drums beating, and encamped to the south of the city.

The temperature was mild $1\frac{1}{2}^{\circ}$ R., and the health of the troops good, with the exception of some of the native regiments, who had been in the Khyber, and who had 50 to 80 sick per regiment.

Herewith the chief operations of the Peshawur force were provisionally brought to a close.

Meanwhile Maude's division had moved from Peshawur, and Jumrood into the Khyber, and to ensure the safety of the road, was undertaken several expeditions, with the object of punishing the predatory tribes. The most important of these was the one to the Bara valley; the force was composed of 2,300 men, and two guns, and started from Ali Musjid, and Dakka in two columns; they only found deserted villages, which they burnt to the ground. On their return march, they had some skirmishes in which their loss was one killed, and seven wounded.

By the end of the year, the whole of Maude's division, which had reached a strength of 7,000 men, was distributed in the Pass, but still disturbances did not altogether cease. On the 31st December a party of hill men occupied a position, that had been abandoned by the British, cut the telegraph wire, and cut off communication with Ali Musjid. A column had to be sent from Jumrood to re-open the road.

Early in January the Mahsud Waziri tribe invaded British territory, and plundered, and burnt Tonk; to prevent the repetition of such acts, re-inforcements were sent to Bunnoo, and Dera Isinail Khan, and they succeeded in dispersing a band of 300 men, that had again assembled near Tonk.

RESUME.

The existing situation of the Anglo-Indian Army in Afghanistan, as brought about by their recent operations, may be briefly sketched as follows.

Owing to excessively bad roads, the unfavorable time of year, the difficulty of getting supplies, and the unfriendliness of the tribes, the British were obliged, although carrying on an offensive war, and in spite of the taking of Ali Musjid and the Peiwar, to take up and maintain throughout a defensive attitude. This necessitated enormous expenditure, and placed them in a position inconceivably disadvantageous, to an army carrying on an offensive campaign.

On the principal line, Peshawur—Jellalabad—Kabul (319 $\frac{\text{Kms.}}{2}$) 16,364 men at the outside are distributed, including 7,544 Europeans;

these are chiefly stationed between Jumrood, and Jellalabad ($169 \frac{\text{Kms.}}{''}$) from Kabul), and are under the command of Generals Browne, and Maude.

On the Thull—Shuturgurdan—Kabul line ($319 \frac{\text{Kms.}}{''}$), there were not more than 5,776 men (1,815 Europeans) distributed between Thull, and Shuturgurdan, under the command of General Roberts.

Both forces were prevented from advancing by vast mountain ranges impassable during the winter.

On the third line Multan—Shikarpur—Quetta—Kandahar—Ghuzni—Kabul ($1213 \frac{\text{Kms.}}{''}$), there were 11,590 men (3,380 Europeans) under General Stewart. This column having to hold the very long line of communication from Multan to Kandahar, was necessarily much reduced before beginning its advance from Kandahar to Kabul ($509 \frac{\text{Kms.}}{''}$), and it was further necessary to leave considerable garrisons in Khelat-i-Ghilzi, and Ghuzni. As soon as they had crossed the Har-i-dana pass they were to push forward towards Kabul, in order to attack in rear the defenders of the Shuturgurdan,—and Khurd Kabul—passes.

As Russia, as a preliminary measure, abstains from any interference, the three columns will unite next spring in Kabul. The “perplexities of conquerors” will then commence, and the question of how to turn the situation, created by the war, to the best advantage of Great Britain.

The idea of the embodiment of the whole of Afghanistan into the British dominions cannot be reasonably entertained; even the annexation of any considerable portion of it is improbable, as the retention of it would necessitate permanently such a large number of British troops. The same objection holds with regard to the continued occupation of the three most strategically powerful positions in the country Herat, Kabul, and Kandahar. Herat is $661 \frac{\text{Kms.}}{''}$ from Peshawar, and $826 \frac{\text{Kms.}}{''}$ from Quetta, and, by reason of these distances alone, must be almost entirely beyond the sphere of English control. Kabul is $309 \frac{\text{Kms.}}{''}$ from Peshawar, Kandahar $237 \frac{\text{Kms.}}{''}$ from Quetta, and both places require not only very strong garrisons, but also permanently occupied lines of communication. This solution is therefore extremely improbable, for the reason that the political administration of the country would be almost impossible. “Divide et impera” is the principle on which England’s power in Asia has been established, and the St. James’ cabinet appear to intend to act on it also in Afghanistan; instead of the rule of the Amir, they will try to establish three independent states, Herat, Kandahar, and Kabul. It would very soon become impossible, owing to the independent spirit of all these Afghan chiefs, to keep British

garrisons in the chief towns. Both military, and political considerations therefore are opposed to such a course.

A much more moderate line of action seems likely: namely a rectification of the frontier, which would leave the eastern debouchés from Afghanistan in the hands of the English. In any case the Khyber, and probably the Peiwar, Ghuleri, and Khojuk passes will be annexed, and besides this the furthestmost outposts of British power might be advanced so far towards the west, as to enable them to reach Kabul, or Kandahar before the Russians.

The sources of information regarding the Anglo-Afghan war at our command up to the present time, are the official despatches besides the non-official telegrams from Head Quarters which have been "examined by a censor" and the newspaper reports. This censorship is carried to such a pitch, that the little that reaches us in this way is so qualified, as to divert attention from the most essential points.

One main fact, that we have ascertained, is, that the machinery for mobilisation in the East Indies is as slow, and cumbersome as in the mother country. This is the more remarkable as the Indian army has no reserves to draw upon, and it's one object should be, to be ready for instantaneous action. The condition of unpreparedness is all the more surprising from the fact, that England, ever since the beginning of the war in the East, has foreseen the eventuality of a collision with Russia, and has been continually making preparations with much ostentation both in England and Asia, and also, that not only had the Afghan war been considered, and talked of long before it came to a crisis, but that England was the one to hurry on the commencement of hostilities. If therefore England after the brutal insult to its mission under Sir N. Chamberlain, waited two months, instead of immediately striking the first blow on the 21st September, the cause undoubtedly was, not that the Court of St. James wished to give the Amir "one more chance of peace," but that it was an absolute impossibility to begin operations sooner. The English, and Indian Governments must have known, that "he who strikes quickly strikes double," and that each day's delay brought them nearer to winter, a season in which, as had been too well proved by the first Afghan war, extensive operations in such a wild mountainous country were not to be thought of: they must also have been aware, that every day's delay rendered the open, or secret assistance of Russia to Afghanistan more probable.

Careless of the fact, that mobilisation would take at least two months, we see them allowing their military preparations to remain incomplete, and insufficient in every particular.

The number of troops placed in the field, although they have so far suffered scarcely any loss, is manifestly insufficient for the demands of the war; the equipment leaves much to be desired; the means of

supply, transport, and the medical service were, at the beginning of the campaign, in an absolutely deplorable condition, and if matters are now in a somewhat better state, it can only be ascribed to the two months postponement of the operations.

The performances of the Anglo-Indian troops in the campaign have been severely criticised by their highest military officers, and by the English press, and their own friends; we shall understand this when we observe how despicably the Afghans fought. Nothing much in the way of a system of military organisation can be expected in such a wild impracticable country. But even when in possession of strategically strong positions, they made no resistance, worthy of the name, and this accounts very plainly for the small losses incurred by the British. The infallible rule by which resistance can be estimated, is the loss of the victors; and if we look at the only two events worthy of mention (all the others being mere trifles), we find at the taking of Ali Musjid, the British losses were 2 officers, and 40 men killed; and one officer and 40 men wounded; and at the so-called "Battle" on the Peiwar pass, which lasted 12 hours, 2 officers, and 25 men were killed, and 2 officers and 70 men wounded. With these figures before us, we can hardly believe our eyes, when we read in the official reports, of the terrible rain of bullets, of the disastrous fire from the Afghan guns, of the brilliancy of the charges, of the wonderful conduct of this, and the incomparable behaviour of that splendid regiment, and other similar exaggerations. After such hyperboles, it is well to take a plunge into the "chalybeate bath" of the Napoleonic Campaigns, and to observe the figure to which the losses rose at Eylau, Aspern and Esslingen, Wagram, Boradino and Mohilov, and in the various campaigns from 1854 to 1878. It is well to do this, in order to regain one's senses, and a right comprehension of the true gravity, and importance of war.

The untrustworthiness of the native element in the Indo-British army, with regard to which even the English do not deceive themselves, is apparent even in this victorious campaign; we have authentic particulars of one circumstance, which occurred in the course of it, which might have been disastrous in its consequences, and this one case gives matter for serious consideration.

On the night of the 1st December, the 29th Native Infantry was marching at the head of Roberts' Column, which was to attack the left wing of the Afghans; the regiment had arrived at within a mile of its destination, when two shots were fired from its ranks, this of course threatened to betray and therefore frustrate the whole undertaking; Roberts immediately sent the 5th Goorkhas and 72nd Highlanders to the front. The enquiry of the Court Martial proved, that the shots had been fired for the purpose of warning the Afghans; the soldier who fired the first shot was hung, another was imprisoned for two years, and the native officer implicated was transported for ten years. Truly if there is one thing more astonishing than another in

this campaign, it is the fool-hardiness of England in carrying on a foreign war with these native troops, and the sublime courage of the British officers, who served with them, which is beyond all praise. When it is considered, what utterly contemptible enemies the Afghans are, the English tactics become in great measure justified, but their tendency to scatter, and break up their force, a course most dangerous both tactically, and strategically strikes us at every turn; and against an enemy of anything like equal power, their extensive operations would have been impossible to carry out, owing to the insufficiency of their numerical strength. At the taking of Ali Musjid, we see the total force of 6,500 broken up into three columns, so completely isolated from each other, by time, place, and the nature of the country, that united action, or timely cooperation were equally impossible. An intelligent European enemy, with a small but steady force, would have attacked the main body, and cut it to pieces; or protected by such a strategically strong position as Ali Musjid, would have fallen upon Tytler's, and Macpherson's brigades, while they were wandering among the rocks of the Rhotas hills, and through the passes between Kata Kushtia, and Panipul, and completely destroyed them.

The British short comings are also evident in the insufficient protection of their lines of communication. Napoleon's I. saying, "The line of communications must never be left unprotected, this is the A.B.C. of the science of war," could not be adequately obeyed, on a account of the deficiency of troops. No intelligent person can reproach the English commanders for having endeavoured to bribe the hill tribes on the line of march, in order to ensure its safety; but even the most enraged Englishman will hardly venture to assert, that the compacts, and bargains with these rapacious tribes were proofs of military superiority. On the contrary, buying the good will of these robbers, is much more like an open confession of weakness, and involuntarily reminds one of an African exploration expedition on a large scale.

The crisis passed through from the 29th November to the 4th December, clearly proves how dangerous it was, to trust the protection of the road to these people, notorious as they were for their treacherousness, and avidity, and yet if they wished to reach Kabul, the British forces were manifestly insufficient for even an occupation of the line, and for flying columns. This is evident from the fact, that although the head of Browne's Column still remains half way from Kabul, and the whole of Maude's Division is stationed in the Khyber, they have hardly succeeded in making the line safe.

If we take all these important points into consideration, "*sine in æt studio*," we shall not be dazzled by the progress of the British arms hitherto.

In reviewing the progress of the Anglo-Afghan war, we shall gain an insight into England's military power in Asia, and into the present warlike capabilities of Great Britain.

That these are neither equal to her position, and its attendant dangers, nor that they in any way come up to the requirements of present warfare, has been repeatedly demonstrated both in her Parliament, and by her press. In 1878 after six months of laborious preparation, she was still not in a position to place in the field one single army corps of 30,000 men; and no one, who studies the subject, can help coming to the conclusion that England can only succeed in maintaining her present position in the world, by an increase to her military force, carried out on a very large scale.

But drastic military reform corresponds so little with the traditions of the English people, and with the materialism of their views of life that its being carried into effect is extremely improbable.

However, when England finds she can buy no more Hessians, and no longer get any Spaniards, Portuguese, or Austrians willing to have their bones broken in her interests, when she is convinced, that her Indian population is worthless as military material, and that in Turkey only, militarily, and politically broken down, she was a doubtful and untrustworthy ally, she will one day come to the knowledge, that with her, as with every kingdom in the world, nothing can compensate for the want of military organisation. She will have to pay more dearly for this knowledge, even than did the more securely situated United States of America, who nevertheless had to atone for the neglect of their military organisation, by the War of 1861-65, by 14,000 million gulden of war expenses, by the loss of a million of men, and by the ruin of their Southern States.

England will have to acknowledge, that the law of the struggle for existence, which imposes such burdens on the nations of the Continent, is of inexorable universality, and she will be convinced, when it is too late, that it is hopeless to attempt to improvise in the hour of need, an organisation, which other nations have labored for the last century to create, with all the power of their minds, and the self-denying capabilities of their hearts, that is to say: an army increased, and increasing in proportion, to the rapidly progressing science of war.

III.

A FEW REMARKS ON THE EMBARKATION OF THE MALTA CONTINGENT IN APRIL AND MAY 1878.

BY CAPTAIN A. B. STOPFORD R.A.

Orders for the despatch of a force of about 6000 men* were received by the Commander-in-chief of the Bombay Army about the 10th April 1878, but so strictly was secrecy enjoined, that, until the 16th of April, little or nothing could be done in the way of preparation.—

On the 14th April instructions were received for the despatch, by the mail of the 15th, of an officer of the Quarter Master General's Department, and one of the Commissariat Department.—Their passages were to be taken to Port Said, but their actual destination was not communicated.—They were given sealed orders which they were not to open until after the steamer had passed Aden.

Two Committees, each composed of an officer of the Quarter Master General's Department, an officer of the Indian Marine, a Medical officer and a Master Builder, commenced, on the 17th April 1878, the survey of the ships in the harbour; one Committee, to which were attached an engineer and a boiler maker, inspecting the steamers, and the other, the sailing ships.

The Marine Department had previously received confidential instructions to make notes of the vessels in harbour which were best adapted for Transport Service, consequently little or no difficulty was experienced in the selection of the most suitable vessels to be engaged, and only a few of those surveyed were rejected.—

It was understood, that the force was to be despatched as quickly as possible. It was therefore found to be impossible to comply fully with the letter of the orders contained in the Transport Regulations, Part. I. Chapter II. as time did not admit of the forms for Preliminary and Primary Surveys given in appendices VI. and VII. being properly filled in.—It was therefore decided to use forms of "Inspection Report of Survey" which have been in use since the publication of Bombay G. G. O. 568 of 1860, and which forms, it is believed, were printed on the issue of that order.

* See note A.

Particular duties of Committees.

The main points to which the Committees directed their attention were, in steamers, Tonnage, Horse Power, Average Speed,

Date on which last docked, state of vessel, Engines and Boilers, Dimensions, and number of troops that could be accommodated.*—

Means of Ventilation.—

Number of life and other boats. Water that can be carried and condensed on board.—

Fire Engine and hose.—

Number of towing hawsers on board and supply of awnings and curtains.—In sailing ships the same points were enquired into, with the exception of

Horse Power
Speed and

State of Engines and Boilers.—And as the sailing ships were mainly required for horses, it was important, that in such vessels the height “tween decks” should be as great as possible.—

The Committee recorded on the forms of Inspection the requirements of the ship, such as additional boats, hawsers, fire engines, awnings, &c. The main requirement was ventilation, and on the forms were written all the additions that were considered necessary. The sailing ships, many of which were of wood, being required for horses were a good deal cut up; and though the owners generally protested, the results have proved that such cutting up was desirable.

An extract from the Inspection survey of one of the wooden sailing ships, is given below showing the orders that were given to improve the ventilation.

“Six windsails, each 2 feet diameter.

“Thirteen side scuttles of 10 inches each to be cut in each side of “the ’tween decks.

“One trunk three feet square to go through forecastle to ’tween decks.”

“Four planks to be taken up on each side forward, for a length of 40 feet.

* See note B.

"Four planks to be taken up on each side aft, for a length of 35 feet.

"One Trunk four feet square through fore part of deckhouse.

"Two Trunks two feet square on each side of deckhouse.

"One Bell mouthed ventilator of 18 inches diameter on each side of deckhouse.

"The after scuttle to have a trunkway fitted."

The positions of the ventilators, trunks &c. were marked with chalk on the decks at the time.

A bulkhead was ordered to be erected in the 'tween decks to separate the horses from the men.*

I will here enumerate the most important points in which the pre-
Points in which the parations and arrangements, as regards the
Transport Regulations transports, differed from the instructions con-
could not be followed. tained in the Transport Regulations.†

(a) The "Preliminary" and "Primary" Forms of Reports, Appendix VI. and VII. were not used in the surveys of the ships, but an old form was found to answer the purpose equally well, and at the same time to allow the inspections to be carried out with greater despatch.

(b) Time did not allow of the sides of the iron ships being coated in the interior with wood, so double date palm matting was hung all round the sides of such vessels, for the whole height of the "tween decks."

(c) Three feet was found to be the greatest width that could be spared to be left clear in rear of the horse stalls. The tendency of all new ships now a days is to be built with less and less breadth of beam.

(d) The ponies were not accommodated with a stall for each, but "pens" were made, each pen taking three ponies.

A Transport Committee met daily, morning and evening, at the
 Transport Committee. Dockyard until the required number of ships
 had been taken up.

The object of this Committee was to expedite the investigation, by the Quarter Master General's and Marine Departments conjointly of all

* See note C.

† See Note D and E.

particulars regarding the vessels selected. The Committee, by receiving oral evidence from members of the Survey Committees, and from owners and masters of vessels, was able in a very short time to settle much business.

The orders stated that the force was to be embarked with the utmost despatch. The troops were named and Duties devolving on General Officer in Bombay. all preliminary arrangements made by army Head Quarters ; after which the duty of reception and embarkation of the troops, including the railway arrangements &c., was handed over to the General Officer Commanding Bombay District.

One steamer and one sailing ship, were ordered to be fitted and Transports for Madras despatched as soon as possible to Cannanore to Regiment. take up the Regiment of Madras Native Infantry, which had been detailed for service, and convey them to Aden. Two vessels were accordingly allotted by the Transport Committee to that Regiment, and they were taken in hand at once by the Dockyard authorities.

On the 18th April were published two circulars; one by the Circular from Quarter Quarter Master General, the other by the Master General. Adjutant General. The former gave instructions as to the composition of the force to be despatched, the preparations to be made in concert with the marine authorities, and allotted to the General Officer Commanding Bombay District the duties of:—

(a) The movement of the Troops by rail into Bombay from their last halting station.

(b) The reception and encampment of the Troops on arrival.

(c) The Allotment of the Troops to the several transports.* This duty to be carried out in communication with the Transport Committee.

(d) The embarkation of the Troops.

Circular from Adjutant General. The Adjutant General's Circular entered into all the details of:—

(a) The number of followers to be allowed to each regiment.

(b) The number of servants to be allotted to each officer.

(c) The clothing, and other special allowances to soldiers and followers.

Preparation in Bombay. There was no difficulty in making the Railway arrangements.

* See Note F.

With regard to the reception of the force it was decided that all mounted troops should be encamped in Bombay before they were embarked on board their ships, but that Infantry, including Sappers and Miners, should go on board on the day of their arrival by train.

A printed circular memorandum was issued from the Office of the Assistant Quarter Master General, Bombay District, showing, in a tabular form, the allotment of officers, troops, followers, horses, cattle etc. to the several vessels.

Fortunately, there were three points from which the embarkation could be conveniently carried on, and all three of which might be utilized at the same time; viz., the Carnac Bunder, the Apollo Bunder, and the Dockyard Slip. It only remained to make sure that a sufficiency of troop and horse barges, and tugs to tow them off to the ships, were prepared, to prevent the occurrence of any delay.

On or about the 22nd April, it became apparent that there would be three difficulties to be overcome. First, the Commissariat Staff, was too small to carry out the immense task of provisioning so many ships in so short a space of time. Second, the means in the Dockyard of furnishing the necessary supply of water tanks was found to be quite inadequate. And third, the resources at the disposal of the marine authorities were insufficient to ensure the fittings of all the transports being completed in time.

The first difficulty was overcome by summoning from ten to fifteen officers from various corps stationed in or near the Presidency, and entrusting to them the duty of supplying the transports from the pier. The Commissariat Department could then confine their energies mainly to the transport of the necessary provisions and stores from their own premises to the pier. It then devolved upon the officers on this temporary duty, to each of whom were allotted one or two ships, to distribute these provisions in proper proportion to their several vessels.

The second difficulty was a more serious one. Every nerve had to be strained to collect new iron water tanks. Many serviceable old ones were appropriated from different spots in and near Bombay. The attempt was made to substitute wooden for iron tanks, but the former were found only to be of use when ample time is given for them to sweeten, to prevent the water from being tainted and to swell, to prevent their leaking. Eventually, sufficient iron tanks were collected and shipped, and in some vessels additional wooden tanks, were added.

To overcome the third difficulty, that of fitting the ships; extraneous help was called in. The Public Works Department, the Municipality, and the Port

Trust, by each taking a few of the vessels in hand, relieved the Marine Department of the great stress which had been laid upon it.

The arrangements for the embarkation from the several piers were to made, that one of them, the Carnac Bunder, was allotted solely to the infantry, who worked their baggage into the troop barges, followed it on board themselves, and were towed off to their ships. Another pier, the Apollo Bunder, was allotted to the guns of the Artillery, which were embarked on troop barges, and to the baggage and followers of the mounted corps; cotton boats being employed to take them off to their transports. The third pier, or rather 'slip,' at the dockyard was retained solely for the embarkation of mounted men and their horses.

Each barge which was to carry horses was fitted with a wooden railing, enclosing a space capable of containing from 45 to 50 horses. The barges were connected with the shore by three railed gangways, each of $9\frac{1}{2}$ feet width and 15 feet length. These gangways were joined together at their ends to make a long passage of 45 feet in length, which hinged, so to speak, at the outermost joining and accommodated itself to the rise and fall of the tide.*

As each transport was reported ready by the Marine authorities for the reception of stores, intimation was immediately sent to the Commissariat Department, who began provisioning her at once. The troops from the Bengal and Bombay presidencies were rationed in accordance with para. 121 Part I. of the Transport Regulations of 1871, the Madras Native Infantry and Sappers being provisioned in accordance with para. 352, page 69 of the pay code of 1876. Goats and sheep, were shipped for the Ghoorkas and the 31st Bengal Native Infantry. Supplies to meet the full requirement of salt meat not being in store or obtainable in the market, preserved meat was shipped in lieu for the European troops.

The Supplies of provisions were calculated for

1	month's	sea stock
1	"	land stock
4	"	Dhall and ghee
2	"	Rice.

A reserve of hill tea and rum for the Europeans and of curry-stuff for the natives being also shipped.

The two ships which had been detailed for the regiment of Madras native Infantry having been fitted and provisioned in Bombay harbour left there for Cannanore on the 23rd April.

Sailing of the transports for Madras Troops.

* See Note G.

On the 24th April the first corps of the expeditionary force, viz. Arrival of troops in a battery of artillery, arrived in Bombay. It was followed by another battery on the following morning, and troops continued to arrive daily from that date until the 2nd May.

During the time that the artillery and cavalry were encamped in Bombay, they were fully occupied in the care and preservation of their harness, saddlery &c.

Packing of saddlery and harness.

These were carefully packed in deal wood cases, which were made up in the Bombay arsenal by the ordnance Department, no vats or casks being available. The cases for the Royal artillery were made to contain, each, one set of harness complete; they measured 3' 6" x 2' 8" x 2' 6". The cases for the cavalry were also of such a size as to take exactly one set of saddlery, each measured 2' 8" x 2' 2" x 2' 3".

The ironwork of the saddlery was protected by mercurial ointment, the harness with dubbing. The whole was wrapped in wax cloth and gunny, with camphor and pepper sprinkled over it. Five gallons of Rangoon oil per Infantry, and three per Cavalry Regiment were allowed, to enable the arms to be kept in order during the Voyage.

The embarkation commenced on the 26th of April with the shipping of the guns, waggons, &c. of one battery of Royal Artillery. It was here apparent how important it is that the ballast in the hold of the vessel should be levelled, and a layer of shingle spread over it, before any attempt is made to lower the carriages on to it.* The arrangements made for the embarkation were found to answer. The only interruption was caused by an outbreak of cholera in one of the batteries encamped in Bombay. In order to check this attack it was decided to send the battery to sea as soon as possible.

Commencement of embarkation.

A few general notes on the embarkation are given below.

The first detachment left the shore at 7 A.M. on the 27th April, and the last pony was shipped by 10-30 A.M. on the 3rd May.

General Notes.

The troops were embarked as fast as the ships were ready for them. The Cavalry and Artillery were allowed at least one night on shore after leaving the train; the Infantry, two hours.

Taking the three arms separately per shipload; † the Infantry, 300 men, took approximately four hours from the time of arrival of their train until they were placed on board ship.

Time, per shipload, occupied in embarkation.

* See Note H.

† See Note I.

The Cavalry took, from the time of arrival at the point of embarkation, seven hours per shipload of from 90 to 100 horses.

Each half battery of Artillery, approximately one shipload, including guns and proportion of waggons (the 2nd line of waggons was not supplied with draught animals) took about eleven hours from the time of its arrival at the point of embarkation until all were on board.

It was found to take an hour to embark 100 horses with a 'Sowar' or 'Syce' for each horse, on board three barges. It took half an hour to tow them off to the ship, and another half hour to put them into position alongside, and to get all ready for hoisting the horses on board.

Time occupied in alighting horses.

Three minutes per horse may be taken as a fair average time required to sling each cavalry horse from the barge to its stall on board, and two minutes for each Artillery horse. Some ponies took 55 seconds each.*

Working parties or strong coolies should be sent on board to expedite work, by manning the fall of the rope, when horses are being slung. The ships crew is seldom sufficient. They have to knock off work for meals, and sometimes strike altogether on Sundays.

From the above we may fairly calculate that :—

Time, per corps, occupied in embarkation.

A Native Cavalry Regiment of 400 sabres may be embarked, complete, baggage and all, in ten hours.

A Native Infantry Regiment in six hours.

A Battery of Artillery in twelve hours.

NOTE. A.

The composition of the Force was as follows :—

- 2 Batteries of Field Artillery.
- 4 Companies of Sappers and Miners.
- 2 Regiments of Native Cavalry.
- 6 Regiments of Native Infantry.

The numbers may be very approximately given as below :—

- 120 European Officers.
- 345 European Soldiers.

* See Notes K and L.—

125	Native Officers.	
5555	Native Soldiers.	
2395	Followers.	{ Public 1330.
		{ Private 1065.
1405	Horses.	
525	Ponies.	
49	Bullocks.	

NOTE. B.

It may be interesting to know the manner in which the measurements of a ship should be taken, and its accommodation for troops calculated.

Before commencing, I will state a few considerations which should be borne in mind when such calculations are being made.

First, as to the height "tween decks." This, for horse transports should be not less than 7 feet from deck to beam. (The height from deck to deck is greater than the height from deck to beam by the depth of the beam, generally about 10 inches). Experience, has shown that vessels suitable for the conveyance of horses, with a height of 7 feet 'tween decks will never, except under most unusual circumstances, be, in a harbour like Bombay in sufficient numbers for a force such as was despatched last year. It will, therefore, be necessary to make up the requisite number by selecting those vessels that have the greatest height 'tween decks less than 7 feet. No vessel in April, 1878, was allotted horses that had a 'tween deck height less than 6 feet 8 inches. In order therefore that as few vessels as possible with a 'tween deck height of less than 7 feet should be employed for horses, it is apparent that the vessels with the greatest 'tween deck heights should be filled with as many horses as they can carry, provided that accommodation be also furnished for the men who must necessarily accompany the horses. The rest of the men could of course be conveyed in any vessel that has 'tween deck height of 6 feet. I lay stress on this that it may be understood why, when, for example, a vessel would conveniently and exactly carry a troop of cavalry, which of course to regimental authorities would appear to be a simple arrangement, a troop of cavalry complete would not be allotted to the ship, but the number of men would be reduced and additional horses from another troop told off to it.

Suppose a troop going on service, with its proportion of regimental establishments, such as Syces, hospital, &c., numbered, speaking very roughly :—

80 horses
80 fighting men
80 followers

Some vessel would probably be found which would conveniently carry this troop complete. But in the event of the ship being ascertained from it's measurements to be able to take more than 80 horses, it has been found advisable, for the reason given above, to allot to it as many horses as it can take, leaving room for one fighting man per horse, and about 20 followers for the whole ship.

I see that recently in shipping horses for the Cape from England there was frequently not more than one man for every two horses.

This, I have no doubt, is a sufficient proportion when the transports are bound for a known, friendly post, where plenty of labour is procurable on arrival. But when the Malta expedition was despatched, it's destination was perfectly unknown; each vessel was, therefore, bound to be prepared to disembark it's own horses at any point to which it might be ordered.

It is assumed that horses cannot be properly accommodated in any part of a vessel that has a less width of beam than 25 feet. This width, is necessary to allow the following measurements, 6 feet clear roadway down the centre; 6 feet for each horse's stall; 6 inches thickness for each of the four stanchions, and $2\frac{1}{2}$ feet passage in rear of the horses. These are not the average, but the minimum dimensions.

There must be one spare stall for every 10 horses.

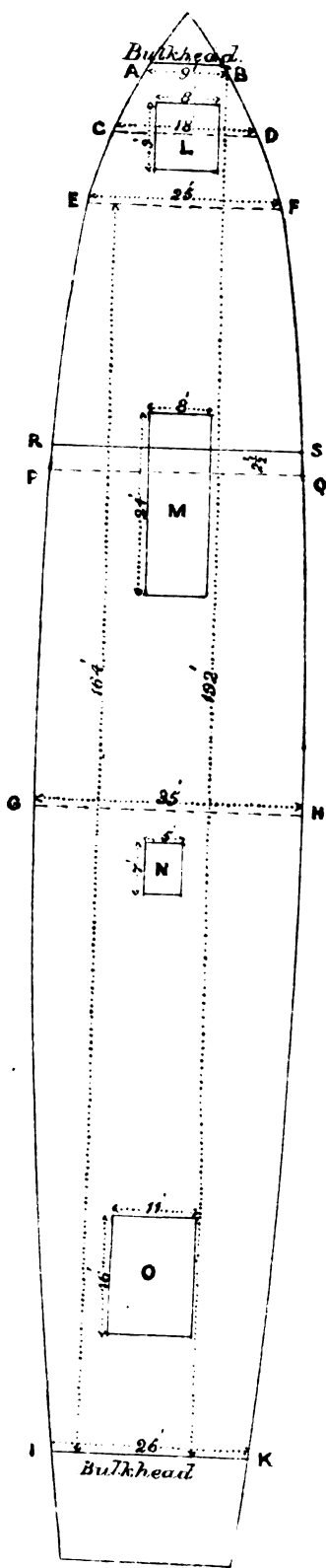
The allowance of superficial area on board ship is for a European $10\frac{1}{2}$ square feet, for a native 9 square feet. For two horses, one on each side of the centre roadway, $2\frac{1}{2}$ feet breadth of stall, including stanchions, with a width of beam of not less than 25 feet.

From the above we may calculate that the superficial area required by two horses, opposite each other, one on each side of the ship, is, including passages, not less than $62\frac{1}{2}$ square feet, which space would accommodate generally not less than 6 Europeans or 7 natives.

In the accompanying diagram the width of beam aft is given as 26 feet, which would allow of horses being brought right up to the after bulkhead. Some vessels have a width aft of less than 25 feet, which leaves room for men to be accommodated abaft the horses. But I should never report such space as being suitable accommodation for human beings, on account of deficient ventilation, and as it is always small, I should utilize it for a store room or some such purpose.

"Projection" is the term used in the measurement of the area of a deck to denote any part that is not available for the accommodation of troops, being occupied by gangways, masts, chainlockers, &c., In calculating the accommodation for horses the projections need not generally be taken into account.

The measurement of only the 'tween decks are taken; for, although one third of the men should always be on deck, still there should be



sufficient accommodation below for all, in the event of such an emergency as "battening down." The Transport Regulations lay down that "the lower or orlop deck" of vessels should not be used for the conveyance of troops as a general rule."

Now let us imagine ourselves to be standing on the 'tween deck of a vessel wishing to be engaged as a Transport. (See Diagram.)—The space available for the military is from bulkhead A. B. to bulkhead I. K. Our object is to measure this space and to report how many Europeans, natives, and horses, the vessel will accommodate. Having measured the height 'tween decks and found it to be suitable for horses, we then, with a measuring tape, take the width of beam. We first measure the width at the fore bulkhead, A. B. which we find to be, say 9 feet. Then, in order to find a mean width of beam from which we may calculate, fairly accurately, the superficial area of the whole surface, we take another measurement about 8 feet back, at C. D. which we find to be 18 feet. Next we find where the width of beam is 25 feet exactly. This we find to be at E. F. in diagram, and we mark the place on the deck with chalk. We measure the greatest width of beam, at G. H. and find it to be 35 feet; and lastly at I. K, the after bulkhead we find the width to be 26 feet.

Next we measure the total length of the deck, available for accommodation of men, from bulkhead A. B. to bulkhead I. K. we find it to be 192 feet. Then the measurement from the after bulkhead I. K. to E. F. the place marked with chalk, where the width of 25 feet commences, is found to be 164 feet. This leaves 28 feet between A. B. and E. F. The only dimensions remaining to be taken are those of the projections I. M. N. and O, which are found to be, say, 8 feet by 9, 8 feet by 24, 5 feet by 7, and 11 feet by 16. Thus the total superficial area occupied by the projections amounts to 475 square feet.

From the above measurements we may calculate the numbers of any sort of troops, or horses, for whom the vessel is required.

The first thing to be done is to calculate the mean width. This is done, by finding the sum of the five widths taken, at A.B. C.D. E. F. G. H. and I.K. and dividing that sum by the number of widths, viz, 5. This gives a mean width of $22\frac{3}{5}$ say $22\frac{1}{2}$ feet. But here, before continuing, I must enter my protest against this erroneous method of calculating this mean width.

It is apparently the offspring of the Dockyard. The Parsee master Builders, who are members of the Committee of survey, are not to be persuaded that their method is incorrect. In vain I try to convince them that it would be better to take only one forward measurement say that at C. D. about 8 feet from the forward bulkhead, or, if they

insist that the measurement at A. B. *must* be taken, to spare us the error which will be the result of taking that at C. D. also.*

But Messrs. Jamsetjee and Rustomjee Wadia smile at me with pitiful benignity. Not only had they been measuring ships before I was born, but their fathers and grandfathers, who had been Master Builders in Bombay Dockyard before them, had measured every ship that had ever been chartered by Government for the conveyance of troops !!! were they to be taught now, after three generations of experience, to take a mean width !!!! At last I yield. For I consider that to convince these Master Builders would occupy a week, that their signature to the Committee proceedings is necessary, and this expedition is to be got off with all haste. Also that the error resulting from their method of measurement entails a rather smaller number of troops being allotted to the vessel than she can really carry, so the consequence is not very serious. If the error had operated the other way, I could not have agreed to report that the ship would carry more troops, than were shown by her measurements.

To continue. Suppose first that the vessel is not required for horses, but for Infantry only. For the horses of Infantry would be carried on the upper deck, no stalls being fitted for them below. The number of square feet available for men is found by multiplying the total length from bulkhead to bulkhead by the mean width and deducting the area of the projections.

$$\begin{aligned} \text{Length of Ship} &= 192 \text{ feet.} \\ \text{Mean width} &= 22\frac{1}{2} \text{ feet.} \\ \text{Area of projections} &= 475 \text{ square feet.} \\ 192 \times 22\frac{1}{2} &= 4320 \text{ square feet.} \\ \text{Projections} &= 475 \quad \text{ " } \quad \text{ " } \end{aligned}$$

$$3845 \text{ sq. ft.} = \text{area available for troops.}$$

The number of Europeans that can be accommodated
 $= 3845 \div 10\frac{1}{2} = 366.$

The number of natives that can be accommodated
 $= 3845 \div 9 = 427.$

So far all is easy. To ascertain the numbers of men and horses together which should be allotted to the ship without extravagance in space is more complicated. The best plan appears to me to find first how many horses the vessel would carry, putting out of mind all thought for the men, and to adjust the numbers afterwards.

* N.B. If the measurement at C. D. is omitted, the mean width will be found to be $23\frac{1}{2}$ feet. If that at A. B. is omitted it will be found to be 26 feet, and this last is probably nearly correct.

This is done by dividing the distance between E. F. and I. K., 164 feet (this is the distance in which the width of beam is not less than 25 feet) by the $2\frac{1}{2}$ feet allotted to each horse. This will give :—

$$164 \div 2\frac{1}{2} = 65 \text{ stalls on each side.}$$

Therefore the ship could take 130 stalls.

Now to adjust the numbers. Only the space A. B. E. F. minus the projection L. remains for the accommodation of the men, and we have above decided that the ship is to take 20 followers, and at least one fighting man to each horse. Let us suppose A B E F, to be a trapezoid.

$$\text{Its area} = \frac{1}{2} (9 + 25) \times 28 = 476 \text{ square feet}$$

$$\text{Deduct area of projection} = 72$$

$$404 \text{ square feet} = \text{area.}$$

Available for accommodation of men.

Let us also suppose first that the troops to be taken are Europeans.

Now the 20 followers, at 9 square feet per man, require 180 square feet of accommodation.

This leaves only 224 square feet for the Europeans to accompany the horses, and this would only give room for 21 men.

We have, therefore, now our vessels taking 130 stalls and only 21 men, whereas we want the number of men to be equal to the number of horses. The necessary correction must be made by reducing the number of horses and putting men in their place.

The computation is made as follows. We said above that the space occupied by the $2\frac{1}{2}$ feet allotted to two horses opposite each other, with their passages in front and rear, may be assumed to be the space necessary for 6 men. By allotting this space to the men we shall have our horses reduced by 2, and the men increased by 6, consequently the difference between the number of horses and the number of men is reduced by 8. Hence, as our object is to get the numbers of men and horses equal, we calculate that a difference of 8 men is made by taking off the space of $2\frac{1}{2}$ feet which is allotted to 2 horses and giving it to the men.

Now forward of E. F. we can only accommodate 21 men. Aft of E. F. we can accommodate 130 horses. The difference is 109. Divide that difference by 8, which is the gain of men made by the $2\frac{1}{2}$ feet allowance for two horses. That gives 14, which is the number of spaces of $2\frac{1}{2}$ feet each, (total, a length of 35 feet) which must be taken off the horses and given to the men.

Let us prove this. And in proving it, we may fairly omit to take into consideration any projections that may occur, for, if 6 men may be placed in the space for two horses where the width is at a minimum of 25 feet, aft of E. F. where the width is continually increasing towards G. H. the space of two horses will accommodate more than 6 men.—Let us draw a line at P. Q. 35 feet aft of E. F. We want to prove that the number of men accommodated forward of P. Q. is equal to the number of horses that are accommodated aft of it. We know that forward of E. F. in the trapezoid A. B. E. F. there is room for 21 Europeans. We do not know what the length of the line P. Q. is, but, to be on the safe side we will call it 25 feet.

The Area E. F. P. Q. = $25 \times 35 = 875$ square feet which will accommodate 83 Europeans. Add to these the 21 accommodated forward of E. F. and we have a total of 104 Europeans accommodated forward of P. Q.—To find the number of stalls aft of P. Q. The distance from P. Q. to I. K. is $164 - 35 = 129$ feet.

The number of stalls on one side = $129 \div 2\frac{1}{2} = 51$.

Therefore the number of stalls on both sides = 102.

Thus we find that by commencing to erect the horse stalls at P. Q. 35 feet from E. F. 104 men, exclusive of the 20 followers, and 102 stalls can be put into the ship.

Yet this requires one more correction. For, although the ship *could* accommodate 102 horses, ten per cent. spare stalls must be left, so 102 stalls only accommodate 93 horses. The necessary correction is made by adding accommodation for 2 more horses, and deducting it from that of the men. This brings the number of stalls to 104, consequently of horses to 94, and reduces the men by 6, namely from 104 to 98. This brings the horses and men as nearly equal in numbers as possible. This last rule for the correction of adding 2 more horses to the calculated allowance and deducting 6 Europeans (or 7 natives) may be said to hold good in all vessels, as all the ships available as transports in these harbours are so nearly of a size that in no case would it be necessary to add 4 horses and deduct 12 men.

We see therefore that in a vessel of the dimensions given in the diagram, supposing it is ordered to carry Europeans and horses, the front horse stall should be commenced at a line R. S. $32\frac{1}{2}$ feet aft of the line E. F. the most forward place where the vessel has a width of beam of 25 feet.

From the above I would lay down the following rule to find the numbers of Europeans and horses that a transport can accommodate.

Find the total number of horses that the vessel will accommodate, beam being nowhere of less width than 25 feet. Let that number be represented by R.

Find how many fighting men the portion of the deck, with a width of beam of less than 25 feet forward of the horses, will accommodate after allotting space for as many followers as it is desired to take. Call this number of fighting men S.

Then $R + 2 - \frac{R-S}{4}$ = the number of stalls the ship will take and $\frac{9}{10}$ of this = the number of horses she will take, and $S - 6 + \frac{1}{4}(R-S)$ = the number of Europeans she will take.

If the fighting men are natives, then, deducting as before the space for the followers :—

$R + 2 - \frac{2}{9}(R-S)$ = the number of stalls the ship will take and $\frac{9}{10}$ of this = the number of horses she will take, and $S - 7 + \frac{1}{4}(R-S)$ = the number of native fighting men.

I have gone fully into this because I know of no work in which any rule or formula for this calculation is laid down, and, though there may be better and simpler methods of working it out, I am convinced from experience and proof that what I have written above is accurate.

NOTE. C.

This is recommended in page 115 of Sir Garnet Wolseley's "Soldiers Pocket Book."—

NOTE. D.

At the Committee's inspections of the vessels which were to be allotted for the transport of horses, an objection was raised, on sanitary grounds, that the urine of the horses should not be allowed to pass down into the bilge, but that special scuppers should be cut in the sides of the vessel to allow it to run out from the deck direct into the sea. This objection was, however, over ruled. The difficulties in the way of cutting many new scuppers were found to be very numerous. Experience has proved, moreover, that there is no cleaner or healthier way of disposing of the horse's urine than to allow it to pass into the bilge (as ordered in para 39 of Transport Regulations Part I) where it is daily largely diluted with water, and then emptied out by the pumps into the sea.

NOTE. E.

I hold it to be very important that the battens which are laid in each stall, to give the horses a footing and firm hold on the deck, should

not be in one continuous piece of wood. They should be cut to form channels of, say an inch width in three places in each batten. But better still, I think that, if practicable, it would be of immense advantage, not only to the horse but also to the owner of the vessel, if these battens, instead of going straight across the stall, parallel to the length of the ship, were so laid as to have a slight incline from the side towards the rear of each stall, meeting in a point in the centre of the stall, and leaving a channel of, say $1\frac{1}{2}$ inches width, down the centre. I have drawn two plans of stalls. Fig. 1 shows how the battens were laid in the last expedition. Fig. 2 shows how I suggest they should be laid in future. I do not apprehend that, the battens having a slope of not more than 5 degrees, the firmness of the horse's footing would be affected in any appreciable degree. The object of this alteration would be, of course, to allow free passage for the horse's urine to the bilge. During the expedition complaints were numerous of the way in which the urine was retained in the stalls by the battens. Indeed, most Officers in Command had the necessary channels cut themselves after they had been a short time at sea.

It will be observed that in the horse fittings for Transports recommended in Sir Garnet Wolseley's "Soldier's Pocket Book" page 117, there is no necessity for these channels. The reason is, that under the horses, he lays down "false decks" of planking over the real decks of the ship, and leaves passages of $\frac{3}{4}$ inch between each plank of the false deck, the planks of which run "athwart ship;" and the battens being laid on the top of the false deck. But in any hurried fitting out of an expedition this laying down of false decks for horses is certainly to be deprecated. True, the master of the vessel approves of the "false deck" as it saves his deck from the wear and tear of the horses' hoofs. But, unless the real and false decks are so firmly and evenly fitted, and so perfectly caulked, that there is no chance of even water penetrating between them, the intervals between the two decks become receptacles for urine, and all kinds of dirt.

The crevices are quite inaccessible, and it is impossible to clean them. Consequently the stalls get fouler and fouler every day, and the disadvantages of a "false deck" are immensely greater than its advantages. I said above that I think it would be an immense advantage to the owner of the vessel if the battens were sloped as I suggest. I say this because it is of very great importance to the master of the ship to keep his decks sweet. Nothing saturates the decks more, or gives them a more lasting foul smell than horse's urine, and any plan that would tend to preserve the decks from such a taint, by running the urine off as freely as possible, would be a real boon to the owner of the transport.

NOTE F.

The satisfactory allotment of the troops to the several transports required the greatest care and unvarying patience. To allow the Officer

of the Quarter Master General's Department to distribute the force among the various vessels, it is necessary that he should be furnished as soon as possible with full information regarding the numbers of all ranks, and of animals, weight of baggage, &c., for whom conveyance is required. In the old Bombay Separate General Orders instructions were laid down for the guidance of Commanding Officers who received orders to go to sea, what returns were to be sent in, to whom they

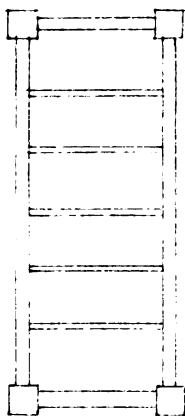


Fig. 1.

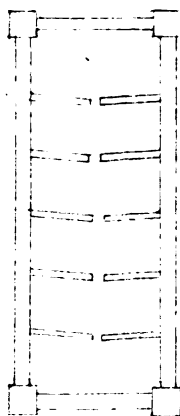


Fig. 2.



already had their full complement of officers. Great inconvenience would have been saved if the Medical Authorities had informed the Assistant Quarter Master General of the number of medical officers for whom conveyance would be required, and, if possible, of the troops to which they were to be attached. In place of this the practice appears to have been to summon the officers to Bombay, where, having reported themselves to the Surgeon General and received their orders, they were told to go to the Assistant Quarter Master General's Office for a passage. At this office they presented themselves quite unexpectedly, perhaps two days before the expedition sailed. They had to be allotted passages in vessels, arrangements had to be made for shipping their horses, and the owners of the ships to which they were allotted

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of the Quarter Master General's Department to distribute the force among the various vessels, it is necessary that he should be furnished as soon as possible with full information regarding the numbers of all ranks, and of animals, weight of baggage, &c., for whom conveyance is required. In the old Bombay Separate General Orders instructions were laid down for the guidance of Commanding Officers who received orders to go to sea, what returns were to be sent in, to whom they were to be sent, &c. But these orders have been superseded, and these instructions do not appear to have been transferred to, or repeated in, any Army or Transport Regulations. Consequently, at the time of the despatch of the force to Malta there was no order extant to the effect that on receipt of orders to proceed by sea the Commanding Officer of the troops to be despatched was to send a statement of his numbers to the Assistant Quarter Master General at Bombay. Endless telegrams were sent calling for returns of strength. This has now been rectified. New para 39 A. of Part I. of the Transport Regulations, by sea, lays down that "on a corps or detachment being ordered to proceed "by sea, the Officer Commanding will at once forward to the Assistant Quarter Master General at the port of embarkation a return of "numbers, &c., to embark, to enable the allotment return to be prepared, any subsequent alterations being notified without delay." The embarkation return given as Appendix XII. of Part I. of the Transport Regulations, by sea, is a good form for the purpose of supplying the necessary information for the distribution of troops, but it is intended to be filled in after a muster has been taken on board ship.

Such embarkation returns as were sent in were on various forms. It would be a great boon if one suitable form were made applicable to all three Presidencies and no variation from it allowed. There would be no difficulty in preparing a form that would meet all requirements, and submitting it to the Quarter Master General's Departments of the three Presidencies for any suggestions or improvements before it was finally adopted.

Up to the last moment medical officers presented themselves at the Assistant Quarter Master General's Office asking for passages, and accommodation had to be provided for them, sometimes in vessels that already had their full complement of officers. Great inconvenience would have been saved if the Medical Authorities had informed the Assistant Quarter Master General of the number of medical officers for whom conveyance would be required, and, if possible, of the troops to which they were to be attached. In place of this the practice appears to have been to summon the officers to Bombay, where, having reported themselves to the Surgeon General and received their orders, they were told to go to the Assistant Quarter Master General's Office for a passage. At this office they presented themselves quite unexpectedly, perhaps two days before the expedition sailed. They had to be allotted passages in vessels, arrangements had to be made for shipping their horses, and the owners of the ships to which they were allotted

had to be warned that additional first class passages would be required on board such and such vessels in order that they might fit up cabins accordingly, suitable for officers. The shortness of this notice was most inconvenient, and in most cases, I think, quite unnecessary.

Again; a very large Field Park accompanied the Sappers and Miners. No intimation had been sent to the Assistant Quarter Master General of the tonnage of this, or of its approximate cubical measurement. Consequently, at the last moment, this important item in the equipment of the force, being found to be immensely larger than had been anticipated, had to be distributed among the transports, as they were found to have spare accommodation in their holds. To prevent a recurrence of this, an embarkation return showing weight and, if possible, approximate cubical measurement of the Park might be sent in advance to the Assistant Quarter Master General at the port of embarkation, who would then arrange that as much as possible should go on board the same vessels that carry the Sappers and Miners, and that the rest should be distributed among certain vessels which had spare hold accommodation. He would then prepare a statement for the Officer in charge of the Park showing how many cubical feet each of the vessels would take. That Officer could then according to his discretion allot such and such portions of the Park to such and such ships, and he would know on disembarkation where each individual article of his equipment could be found.

NOTE. G.

Experience shows that a wharf or landing stage at the outward end of this railed gangway is of great advantage. Horses crowding one on the top of the other into a horse barge cannot be properly and closely packed. Now if there were a flat or horse barge permanently attached to the outward end of the Gangway, and the barges as they came up to be loaded were made fast to this acting wharf or landing stage, the horses might be allowed to assemble on this wharf, and be taken out of it one by one as required on to the flat to be loaded.

NOTE. H.

Every ship can generally provide a good supply of rough planking, which should be placed in the hold on the ballast, and, as the gun or waggon is lowered into the vessel, the wheels should be guided on to a roadway of planks and the gun can then be run along the top of the ballast to its position in the hold.

The carriages should be carefully embedded in trusses of straw, bags of grain, &c., to obviate any chance of their rolling in a gale of wind.

NOTE. I.

It is most important that the necessity of the embarkation being carried out, not by troops or companies, but *by shiploads*, should be impressed on Commanding Officers. With this object, Distribution returns giving the numbers of each rank, and of animals allotted to each vessel should be given to Commanding Officers on as early a date as possible. If practicable, and if there is a suitable dépôt or halting place on the journey by train, it is a good plan that the troops should be divided into shiploads at such a dépôt, and that each train on arrival at the port of embarkation should contain only one shipload. This I know is theoretical, and could rarely be put in practice, but where possible, the advantage of getting the sorting and distribution of troops, followers, horses, and baggage done outside the bustle of the embarking port would be incalculable.

To ensure the followers being taken to their proper vessels, numbers of cards with the names of one transport on each were printed. These were distributed to Commanding Officers who were requested that each follower, on being detailed to a certain ship, might be given a card with the name of his transport on it, with instructions not to part with it until he was safe on board. This plan was found to answer well.

NOTE. K.

The Artillery Handbook for Field service says that when horses are being slung they should be blindfolded. This was not done except in a very few refractory cases. It was the exception, not the rule.

Sir Garnet Wolseley in his "Soldiers Pocket Book" says that horses after slinging should be lowered on to a soft bed of straw which must be provided for them to alight on. I am inclined to think that this grass, for straw in Bombay does not exist, should be covered with coir matting, which gives the horse a footing when he feels his legs. On grass he is very likely to slip and damage himself in his struggles when he first reaches the ground, especially in wet weather. The disembarkation of the force on its return from Cyprus and Malta took place mostly in the monsoon, and occasionally during heavy rain. This rain made even the coir matting slippery, so when possible, it was sprinkled with cinders, or sand, with very good results.

NOTE L.

I have already said (Note G.) how important it is to have a spare barge or landing stage at the end of the pier at the point of embarkation.

Of not less importance is it that alongside of each ship there should be a spare barge or flat during the embarkation of horses. For instance, suppose a flat well packed with horses be made fast alongside a transport, with no empty barge between the two. It is no easy matter to fit horse slings properly on to a horse when he is jammed, as he should be, on both sides with other horses so tightly as to prevent him kicking. And when he has been raised a few feet and his legs are struggling in the air, it is far from improbable that he will kick one of the other horses remaining in the boat. Again, at the time of disembarkation, it is even more serious. To lower a horse into a barge which has already received many horses is almost to court accident. For there not only are the chances of the horse's hoofs as he descends striking other horses to be considered, but also the plunges which a horse always makes on first feeling his feet on the deck. Now, were there an empty barge at the time of embarkation between the side of the transport and the nearest horse barge, the proceeding is very simple. The horse nearest the opening in the railing is backed out on to the empty barge, which he has all to himself. He is slung and hoisted out before the next horse is backed out. Similarly in disembarking, the horse is lowered from the transport on to an empty flat, and on his recovering his legs is marched straight away to his horse barge and put in his place, leaving the landing place empty and ready for the next horse to be lowered.

The number of barges should be not only *sufficient*, but there should be *spare* ones.

IV.

THE STABLE MANAGEMENT OF TROOP HORSES IN INDIA.

SECTION II. OF THE PRIZE ESSAY.

The Diseases and Accidents to which Troop Horses are liable in India from Irregularities in Digestion : their Intrinsic and Extrinsic Causes, and the best available mode of preventing them.

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THE morbid and accidental conditions arising from digestive irregularities may, with a little license of speech, be classed under the head of DIETETIC affections and casualties ; but, if we were to speak correctly, they certainly extend beyond the confines of this branch of Hygienics.

They are brought about by STRUCTURAL or FUNCTIONAL derangement, more probably both, in combination, in any part of the alimentary course between the oral and anal openings : also by similar conditions of certain viscera, which are extern to, though anatomically and physiologically connected with, the said tract, as well as by the aliment that it ingested ; or, with or without such influences, there may result accidents, pure and simple, to begin with, which, like disease, may terminate in convalescence and serviceableness, or the reverse, incurability and death.

It is comparatively easy to trace out predisposing causes, but exceedingly difficult to lay one's finger on the exciting causes, as proved by our subsequent and futile endeavours to remove the supposed "last straws."

Speaking of organic and functional disease or derangement, it is to be observed that the existence of the latter is greatly doubted by the best pathologists as long as the mechanism of an organ remains perfectly uninjured. It is possible that this division is not founded on reality, and that all diseases are attended with organic change. But, be this as it may, we know that proneness to digestive irregularity is the great bane of the troop horses' existence in India ; and yet with so many hundreds of cases before us, and an extensive experience to reflect over, we have not yet *satisfactorily* solved the problem (as shown by results) as to why such great liability to abdominal diseases should obtain.

As might be expected, more blame has been assigned to the food, its character and preparation, and the times and manners of giving it

than to any other influences, because it is an apparent, a palpable and probable agency, upon which, even the amateur, supported by practice and experience, can fairly descant, so long as it remains unshrouded by the mysterious operations of digestion: but it is here, during and after ingestion, that we are so much concerned, nay, puzzled; or rather it is here and at this time that our attention is professionally directed, whenever digestion has become irregular.

By way then of systematizing a subject difficult of arrangement, owing to the way of putting it, we will set aside the diseases and accidents, *pro temp*, and first of all enquire what constitute "IRREGULARITIES IN DIGESTION," and note their connection with the INTRINSIC and EXTRINSIC CAUSES producing them. By reviewing them *seriatim* we shall the easier discuss their results, and determine whether they are pathological or accidental so far as any line of demarcation can be distinguished. The extrinsic causes must be characterized as pertaining to agents acting with violence from without, and chiefly by the patient's own comportment, as well as to agents taken in mainly as food and water.

In literal language, *an irregularity in digestion is a deviation from the process by means of which alimentary substances, when introduced into the digestive canal, are employed in the formation, development and repair of the tissues, and in the production of heat; and are made fit to be absorbed and added to the blood.*

The function of digestion being composed of a sequence of organic actions, it will be as well to note the series, and then consider their deviations in the order of their operation. Thus we have: (1) Prehension; (2) Mastication; (3) Insalivation; (4) Deglutition; (5) Action of stomach; (6) Action of small intestines, and their contributing organs, the liver, spleen and pancreas; (7) Action of the large intestines; (8) Expulsion of the fæces.

Now, these being the natural processes concerned in digestion, it follows that an imperfect, arrested or perverted action of any one or more of them, is, purely, an irregularity in that function, and therefore becomes a cause—intrinsic—of the effects under notice: and, further, structural diseases of the organs concerned are primary intrinsic causes to the said deviations. Malformation, whether congenital or not, will also fall under this category.

The prehensile organs of the horse, namely, the lips and incisoreteeth, seldom give us much trouble, but we have a case in point, technically known, as "Unilateral facial paralysis," where a horse struck his left petreous temporal region with great force against a wall, and, besides sustaining other local and external contusive injuries, the left auricular, palpebral, nasal, labial, alveolo-labial, digastric and buccinator muscles became powerless, owing to paralysis of the portio dura (7th)

nerve on that side, the main trunk of which, doubtless, received its traumatic lesion as it passed through and out of the stylo-mastoid foramen of the petrous temporal bone. Thus we got voluntary motor, emotional and reflex paralysis, the first of which (voluntary motor) most particularly concerns the subject of this paper. (To the ordinary reader of a popular journal, we must apologise for technicalities employed throughout this section of the essay.)

The ear fell sideways, the palpebral fissure was partly closed, corneal ulceration set in, nostril collapsed and became nearly useless, indeed obstructive during respiration, the left upper lip and nose were drawn round to the right, and the lower lip fell pendulous and spout-like, whilst the prehensive manipulation of the lips, and the directing function of the buccinator were entirely lost, and eating and drinking were performed slowly and with difficulty: the head was forced deep into the water to counteract the loss of suction power. Whilst feeding there was a copious waste of saliva, and, in a less degree, when not feeding. The labial and buccal paralysis gradually, though indirectly, induced symptoms of emaciation, not only from loss of saliva but from inadequate insalivation. Here then a beautiful example of a local structural lesion causing imperfect performance of the prehensile and masticatory functions, and eventually producing systemic disturbances, if not disease. The case lapsing from our charge, we lost sight of its termination, but it was apparently incurable. Such cases are of rare occurrence.

Injury to the incisor teeth and their dentition, excepting giving rise to slight fever and occasional gingival and palatal tumefaction, and a few days' disinclination, to feed, seldom create other digestive irregularity.

[N.B.—The “palatal tumefaction.” here referred to is known to horsemen by the euphonious term “lampas,” and many a poor horse has been submitted to the brutal application of a hot iron—actual cautery—to the anterior part of the palate, which may (and strange to say, may not,) happen to be swollen from some systemic derangement. We have often been asked to “burn” the substance of this trifling premonitory, or, it may be, accompanying, symptom of fever or dentition, and by those who ought to know better, and we make a note of it here, parenthetically, in the hope that we may not be asked again. There can be no harm in slightly scarifying the parts, but it is important that the *amateur* should know the disposition of the voluminous palatine arteries before aspiring to a little surgery with the lancet or penknife, or he may feel astonished at the hæmorrhage which would result from their division. “Horses and Stables” states that “to scarify the palate is a harmless custom,” and its author facetiously adds, “and has the advantage of pleasing the GROOM,”—verily, a desirable object in Veterinary Surgery !!]

To return. Fracture of either or both branches of the lower jaw would soon result in death from starvation, unless surgically and medically attended and well nursed.

Malformation, where the upper overhang the lower incisors, and the reverse condition, are seldom seen in troop horses. But such deformities would have untoward results if their subjects had to support themselves by grazing.

The passive organs of mastication—the molars—are a frequent source of concern, their irregularities more than their diseases being the indirect means of perverting some of the succeeding and important sections of the digestive process, inducing colic, constipation, impaction and their sequelæ. Imperfectly performed mastication, arising from voracity, osseous or dental deformity caries, irregularity in the surfaces and serration in the edges (which wound the cheeks and tongue, and cause “quidding” and “bolting” of food,) or whatever else may give rise to it, is likely to be followed, sooner or later, by stomachal and intestinal derangement, because comminution, insalivation and lubrication are inadequate, which, aggravated by the coarseness, hardness, and impurity of forage also furnish the reasons which cause œsophagal impaction, commonly known as “choking.”

Oral digestion can neither be avoided nor even carelessly performed for a length of time with impunity, for the stomach becomes taxed and weakened by the constant prejudicious presence of food unprepared for its physico-chemical actions.

Irregularities in digestion are rarely dependent upon disordered functions of the fauces or pharynx unless structurally implicated by the extension of effects from diseased or injured contiguous organs, as in the deeper-seated tumours of “Strangles.” Calcareous degeneration of the parotid glands, sometimes seen in old horses, is of little consequence except to indicate that the system possesses a degenerative diathesis, leading us to look for calcareous changes in other organs, and particularly in glandular structures. Swelling of the parotids, from any cause may produce the facial and labial paralysis before mentioned, and quite a train of digestive irregularities.

Loss of a portion of the tongue, deep incisions in it, an aphthous condition of the mouth, an open parotid duct, though interfering with the earlier series of the digestive process, cause no very serious or permanent disorder if attended to.

The œsophagus, from causes recently alluded to, sometimes becomes impacted or “choked” with whatever a horse may be eating. A voracious feeder is the most likely subject. The walls of the canal may become constricted either as the result of accidents or a surgical operation in its own or adjacent tissues, from the passing of a probang; or its position, mobility, and therefore its function, may be interfered

with by disease affecting its immediate or intermediate relationships. It is evident that some of these causes may induce a permanent predisposition to choking, though we must look to voracity as the chief one even in that respect, and one not easily got rid of.

Cases of choking have not been frequent in my practice, and I have never known of a fatal termination, but it does occur, though it may not be from the actual impaction. Once only have I seen the necessity of passing a probang in a trooper: this was a very protracted case and dying from starvation. The obstruction was very low down, and offered little resistance: recovery resulted. As choking is an accident (though its liability is increased by disease) whilst feeding, we must prevent irregularity and voracity therein by first of all preparing the food and giving it in such a way as to *compel* mastication; and, secondly, prevent rapid deglutition by feeding as near the ground as possible; this is said to have the advantage of exciting a more copious secretion of saliva than feeding at a higher level. It is useless, nay injurious, to prepare food in such a way as to require *no* mastication, but don't ride the hobby so far in the other direction as to feed horses on whole barley, gram or (worse) Indian corn. Always mix the grain diet with chopped hay or grass and spread it thinly over a large surface.

We now arrive at a most important organ of digestion viewed anatomically, physiologically, and pathologically, for the last condition must be studied in close connection with the first, and second to enable the investigator to arrive at proximately correct conclusions. We refer to the STOMACH, with whose pathology there is also to connect an accidental and structural lesion called RUPTURE, because we are of opinion that it seldom or never occurs without previous atrophy or atrophic degeneration. The diseases to which the stomach is liable are almost without exception, to be traced, in the first instance, to dietetic causes—extrinsic in themselves—which, acting constantly and for a long period, encourage the evolution of intrinsic causes primarily, in the structure of the organ itself, and then in its functions: and both classes co-existing and co-operating bring about such a grave complication of chronic disease as to render it exceedingly susceptible to the influence of exciting causes, which, in a healthy viscus, would produce no abnormal lesion. At this point we shall find it convenient to consider a word or term used in veterinary nomenclature to embrace a set of symptoms indicative of pain in any part of the abdominal region. We refer to "COLIC." I wish to draw the particular attention to the word, because it is generally regarded in the light of a special and almost incurable disease, instead of *an ordinary sign of pain* in a score of abdominal and other affections. It results from *spasm* in one or more sections of the alimentary tract, no portion of which can be said to be entirely exempt. We are unable, however, to point with certainty to the seat of attack where pure spasm is the cause, and we can seldom be sure of what has given rise to the spasm. Flatulency is generally self-evident. Colic may supervene where quite the reverse of spasm

exists, viz:—motor paralysis. Here it would be due to TENSION on the sentient system of nerves of implicated organs, as well as upon those collaterally placed. Then we get colic in rupture of the diaphragm, liver, stomach, any portion of the intestines, bladder, uterus and rectum, also where there is biliary, intestinal, renal, urethral, cystic and urethral calculi; in retention and suppression of urine; in constipation, torpidity, (withdrawal of nervous force) impaction, intussusception, twist, rectal fecal retention; umbilical, inguinal, and scrotal hernia, or strangulation from any cause; in diarrhoea, dysentery; in lead and other poisoning; and in superpurgation; after operations implicating the abdominal and pelvic organs and their external appendages.

Colic (that is, its indications) is inseparable from inflammation of most of the said organs.

In the veterinary registers and records of the army in India the admission of colic cases are numerous (and the average would be raised if all were duly entered), that is to say, it is the common beginning of many fatal and non-fatal cases wherein abdominal pain is primarily evidenced by the violent comportment of the patient. In default of more acute diagnostic perspicacity the plan of registering such cases as "colic" cannot be discarded unless, we wait for their termination before recording them. *No horses die from colic, pure and simple*, but succumb to some lesion—of which abdominal pain is the prominent, and perhaps, the primary symptom, which is generally more or less occult during life, and only declared by a *post mortem* examination. The practitioner, by experience, observation and reasoning, becomes acquainted with the differentiation in the character and symptoms of gastro-intestinal affections, and those of contiguous organs, and he will point with practical accuracy to the seat of attack, nevertheless, he will often prove a little in error owing to the inconstancy of prominent features, to the evolution of unusual ones, and to the irregularity of temperamental comportment.

One animal may smash himself to pieces, injuring everything about him unwittingly, whilst another will remain comparatively passive under the same disease and treatment.

Breed and temperament mainly account for this difference. We glean little from physiognomy in equine diseases, and, owing to the tenseness of the abdominal parietes, gather no information of any value, from auscultation, and not much from palpation and percussion.

Our diagnoses are based upon our personal knowledge of the horse in general, and the patient in particular; upon his own history and that of his case: on breed, sex, temperament, postures and deportment: on oral, rectal, scrotal, vaginal, and cystic examinations: on the duration and intensity of pain: on the character of the pulse, respiration and temperature of the body, and by the condition presented by the visible mucous membranes, aided by experience in the manage-

ment of DUMB life in health, and the treatment of DUMB animals in disease.

Colic, then, being such a common and constant affection amongst Indian troop horses, we are naturally led to cast about for the most common and constant, and therefore, the most probable, cause or causes, that, first of all, act to render an animal susceptible: and it is chiefly to the question of diet and forage or water, as to grass and its quality.

More than ordinary care is bestowed upon the selection of grain; and, though often a source of complaint, it never contains one quarter the impurities, and indigestibles, when given, as the grass forage.

And we can seldom trace any thing of an obnoxious nature in the quality of the water, that is, practically speaking, of its quality; it produces no ill effects, but something may be said relative to the quantity imbibed.

Horses subject to colic are, without doubt, individually predisposed in some way or other, *viz.*, by feeding greedily or ravenously, implying inadequate mastication and insalivation: neglect in picking out the good and rejecting the sandy and earthy covered fibrous roots, and root stems, which a slower or more careful feeder does for himself: by the swallowing of air with the saliva, as in "wind-sucking" and most probably in "crib-biting," for I regard these acquirements as only modifications of each other, both inducing tympany, (gaseous, abdominal distention) pain and chronic indigestion, the results of which are recognised in the poor condition and unthriftiness of horses so indulging: by the accumulation of large numbers of "bots" which tenaciously fix themselves to the inner coat of the stomach; by the existence of tumours and abscesses imbedded between the coats of, and opening into the stomach: by disengagement of gases resulting from *abnormal* decomposition of ingesta; rarely by verminous agents, though several varieties of parasites are to be seen in 90 per cent. of *post-mortem* examinations. These may all be, more or less, regarded as individual predispositions; because, all, singly or conjointly, tend to prepare the animal by impairing one or other of the functional series of digestion, and from which chronic or subacute indigestion results. We do not meet with acute indigestion in troop horses, or, to be more correct, we do not recognise this affection as understood in the nomenclature of human and veterinary medicine.

The consequences of the constant ingestion of grass, coarse, rooty and covered with sand and earth, not improved by being picked up off a sandy floor, or eaten (grain moistened) out of mud troughs, are that the structures of the stomach are brought into and maintained in a chronic or perpetual state of irritability from contact with substances it cannot digest, and which being passed onwards insufficiently chymified continue to exert similar, if not increased, irritating influence in the small intestines and in the large often become massed to impaction.

I have often seen the single colon occluded by large ovoid masses of long intertwined grass stems and roots, almost unravellable; and the ileum by casts of sand, or this mixed with small stones, pebbles, pieces of broken earthenware, &c.

Now this state of things cannot go on for a lengthened period without, secondarily, setting up functional disorder, because the organs under notice are not only overworked but improperly worked: they are asked to do more than nature intended. So, eventually, like an other ill-used organ, they lose their natural powers, become debilitated, attenuated, atrophied, sometimes degenerative and generally relaxed; unable to withstand extra distention from solids, fluids, or gases, or their combination: their secretions become scanty and altered, because the mucoid follicles, peptic and other glands and secreting organs are similarly and contemporaneously affected, and their vaso-motor and specific secretory nerve fibres as well as the entire secreting cells participate in the same atomic changes.

Acid fermentation or abnormal decomposition is apt to set in, local or general flatulence (depending upon circumstances) and tension, even to dissolution, follow; or constipation, torpidity, paralysis or impaction supervene: abdominal pain, *i.e.*, colic declares itself, and the consequences cannot be foretold, but rupture of the stomach's walls is likely to be an early lesion if relief is not soon afforded, and the patient restrained from throwing himself violently about.

Colic and its untoward results are not unfrequently observed to take the form of an enzooty, and may occur year after year in a Regiment or Battery of the same horses, as also in fresh arrivals.

Topographically we are at a loss to account for a cause, but there is ample reason to believe that the climate and weather of certain places may be auxiliary to, and co-operate with the causes before discussed, and provoke an outbreak of colic, quite out of the usual sporadic course.

Adjunctive causes are found to arise from long and fatiguing marches, where food has been inferior in quality, badly prepared and irregularly given, and more particularly at such times that grass is scarce, and what there is, is coarse, innutritive and indigestible.

These affections visit us in this enzootic manner in very cold and also in very hot weather, and we see less of them when it is more temperate.

We certainly cannot ignore the effect of cold on the skin, whose circulation being checked, driven inwards, so to speak, by piercing draughts (unclothing too early for one thing) often pronounces its ultimate influence of a congestive nature on the chylopoetic viscera inducing perversion of functions in organs previously structurally debilitated; then, nothing but an exciting cause in the shape of a copious draught of cold

water, a quickly bolted feed of grain, or a stomach replete with grass, which may be bulky and poor, is required to evoke spasmodic colic, or flatulent distention. In the hottest of seasons when there has appeared no assignable cause, we have attributed colic to be the effect of suspended secretion and digestive function owing to extreme muscular relaxation of the alimentary canal followed by an abnormal decomposition of ingesta. We must not forget that aged horses are most liable to colic; this fact strongly supports the above lengthy argument on its causation.

The stomach of the horse, anatomically described as a single organ, is to all intents and purposes, physiologically, compound, though its oesophageal division may be nothing more than a passive macerating receptacle for the latest received morsels. But whatever is its function, this cuticular, non-secretion section seldom participates in that fatal accident called "ruptured stomach."

We have this lining considerably eroded by the attachment of "bots," but they prefer the softer villous tissues of the true digestive surface, and when present in large numbers must create extensive anatomical or histological destruction, and therefore a diminution of its function.

Where both classes of coats have been removed extensively, it has always occurred in cases where rupture has not happened, and resulted from *post-mortem* digestion. On this account examinations should be made as soon after death as possible to avoid misconceptions, and erroneous inferences, from changes of this kind.

Vomition is not a sure diagnostic symptom of rupture either in the stomach, or in any other portion of the digestive tract: it is much more likely to occur, and does occur, whilst the viscus is *intact*,—though distended to bursting and paralysed,—simply as a passive act, there being, in these cases, no other way unoccluded for the escape of its contents. There is apparently little or no muscular effort of any organ in equine vomition,—at least, this is the inference as one stands by the patient and watches it—excepting where there is partial or total occlusion or constriction of the oesophageal canal, as in choking.

When the cardiac and pyloric orifices refuse to become outlets whilst the stomach is still being distended, something must, sooner or later, give way, and so its peritoneal or outer covering ruptures first, its tissue being that which yields least to the inward tension, and the conjoint pressure from outward violence, such as rolling, plunging and lying down heavily. The muscular coats are the next in succession and extent to give way, and lastly, the mucous (inner) coat ruptures and as a rule, in the smallest degree. These lesions are easily explained in their character and extent by understanding the anatomical differentiations in the structure of the coats of stomachal walls.

Moreover it is always seen that the serous or peritoneal coat is ruptured to the greatest extent—often 12 to 16 inches—where the lesion

has resulted from distention by inordinate solid accumulation, particularly grass, the tension of which is augmented by fermentive gaseation.

The rupture is never so great when supervening on distention by grain or fluid, or by these conjointly, because their exit is much more rapid into the abdominal cavity than that of an imprisoned tenacious mass of grass, which continues to exert its lacerative influence *after* the lesion has commenced, whilst in the other case, the rent would either cease abruptly, or very soon after the sudden exit of matter like non-tenacious grain and fluid. In all cases of ruptured stomach I pre-suppose the co-agency of violence from without, the result of plunging, &c., and without which, we believe it would perhaps, never take place, except as a *post-mortem* contingency. We are, however, taking steps to prove this assertion.

Rupture always occurs along the base of the convex or greater curvature of the stomach, for the simple reason that it is the weakest and least supported region in the viscus, even in health, but much more so where there is considerable muscular atrophy, visceral relaxation, and motor, sentient and organic neurasthenia.

I cannot allow this opportunity to pass without observing that colic cases should, if possible, never be allowed to lie down, whilst there is the slightest tendency to do so violently, or to roll into all sorts of unnatural and hurtful positions: keep them on their legs as long as abdominal pain continues, or until you see the inutility of maintaining them in any position whatever,—a fatal termination being imminent—even fasten up their heads by passing a long rope over a beam, or pulley, or through a ring, and give and take—don't tie—as the cases comport themselves, but keep them the right end up: or place them in slings as soon as they are attacked, by which, I feel sure, a great number of ruptured stomachs and intestinal twists, &c., &c., will be averted. I have every reason to speak highly of the plan of slinging: every case now occurring is put into them, and though I may be speaking without sufficient grounds, I have found the practice exceedingly successful, and besides, it prevents abrasions and contusions to the prominent parts of the patients. The slings are always ready for use, and are of the simplest description; two men can put a horse in and raise him, by the aid of “Weston's differential pulleys”: he can be raised or lowered to the inch, and no knotting or fastening is required, the everlasting chain remains when you leave off pulling.

In my practice a few months ago there was a fatal case where the egress of food from the stomach was prevented by hypertrophy of the pyloric sphincter and its contiguous structures. The stomach and its contents weighed thirty-two pounds, twenty-four of which were computed to be grass, well masticated and in process of digestion. The distention was enormous, and felt more like the ox's rumen in *plenulvia*. The viscus was healthy, and resisted both the inward tension and outer pres-

sure from violent deportment, but from its abnormally large volume, and extraordinary great weight, it exerted undue pressure directly and indirectly on all the abdominal organs, including the large and important venous conduits, and particularly the cæcal and colic tributaries to the vena porta, producing in the cæcum and double colon an appearance of strangulation by ligature. No other organs were similarly affected, and all traces of strangulation ceased at the termination of the ileum, and beginning of the single colon. These deductions may, however, be open to modification.

Besides the atrophic changes which take place in the stomachal parietes, and which must be regarded as pretty constant ones in old troop horses, we must mention the invariable presence of tumours or abscesses of various sizes filled with a caseous-like substance, communicating or not with the visceral cavity by ulcerous openings. Incorporated with a portion of their contents—at least in those that have an outlet—may always be seen hundreds of thread-like nematoid worms of the genus *Spiroptera* and species *Megastoma Spiroptera*, (Gamgee and Cobbold).

The origin, destination and natural history of this parasite is not so very clear: its presence, however, in hundreds must be a source of irritation, and produce some uneasy sensation which can only be imagined by analogical reflection. If these parasites gained access to this habitat in the form of ova, and found the mucous or sub-mucous stomachal tissues a comfortable lodging, we should certainly expect to find more tumours, and smaller conglomerations of nematode life. They are to found free on the mucous surface as well as in the tumours, and seem very much disturbed (like all other parasites!) by the death of their host.

These formations seldom number more than three or four, and are always located *between* the mucous and muscular coats, and never open through the outer or serous coat.

Besides nematodes, their contents consist chiefly of pus and structural debris of various shades of color, and densities of substance, softening towards the outlet, but stiff and caseous deeper. Through their hypertrophic margins rupture never extends. They are in all probability, simple, benign, adenoid tumours arising from irritation or lodgment of a foreign agent in a gland tubule, which may dilate into a cyst, increase by central proliferation, pushing aside, without infiltrating, neighbouring tissues, and afterwards undergoing caseous degeneration.

So-called ulcerations are often nothing more than the erosions made by recently detached and discharged "bots," whose existence in this locality is only temporary. Where rupture of the stomach's walls is extensive, and the mass liberated heavy, the great, or gastro-colic omentum is shredded, and the inješta finds its way all over the abdominal cavity, but, if the lesion is small and the escapement more gradual, then, this

peritoneal reflexion may remain almost intact, incarcerating only a lighter mass.

In the necroscopic appearance of the stomach and other viscera of the abdomen after rupture, strangulation and other, not dissimilar accidents, there is considerable identity, chiefly of a congestive and inflammatory character, seldom sphacelitic or ulcerous, but such are described every day in the scientific journals and standard works. To describe, in detail, these *post-mortem* appearances or to individualize symptoms scarcely belong to the province of this essay.

COLIC.

STARTING again with *Colic*, as the most visible declaration of the more acute effects of irregular digestion, we find the small as well as the large intestines, sometimes the subject of inflammation, in which all the coats generally participate, though in degree,—least of all the serous one—and extending to or from the stomach by reason of structural contiguity, and the operation of the same cause.

We may conceive the causes of congestion and inflammation, and treat them the more successfully by knowing them; at the same time we are seldom sure of them, or their exact seat of operation, or extent of their influence, or of the amount of structure they are involving. The best Veterinary Practitioner is often perplexed, where the human practitioner, in corresponding cases, would be enlightened by his patient's replies; and though our patients never malingere, nor deceive the practised eye, hand and mind, we are frequently misled by those in their immediate charge, and chiefly from fear, of being considered culpable in bringing about the accident or disease; or, we are left to grope about for information, (by cross questioning,) which, for some reason, is withheld. This should not be so in the service, but I have known cases to require a year's treatment to cure before the actual cause leaked out.

We must ever remain more or less in the dark regarding the actual state of things, during the progress of all "cured" cases of internal organs. We may theorise on a case of enteritis or hepatitis, and treat one or other according to the lights of the current era, and if a cure is completed, the precise nature of what has been cured is not undeniably apparent or known. The revelations of a *post-mortem* examination will help us in argument, assist us, perhaps, in future diagnosis and treatment, and is a recognised finger post on the cross-roads of the science and practice of medicine, and that which we have failed, or found impossible to cure, is there declared, but in "cured" cases there is no saying what had to be overcome; thus one is often treating symptoms instead of causes.

Constipation, impaction, torpidity or motor paralysis and their converse, arise from causes which have been considered at length. Intussusception or invagination is exceedingly rare in troop horses: it,

however, occurs during ordinate, inordinate, interrupted or unrythmical peristaltic action of the intestines. The power possessed by the alimentary canal of opening at one part and closing at another is well seen in this accident: the closing portion of the gut forcing itself into or within the opening portion, the act of expansion assisting the movement in virtue of the opening and closing portions travelling in opposite directions.

The act of invagination is produced by a double movement, similar to what would be produced in the œsophagus of a ruminating animal if the swallowing and ruminating movements occurred at the same time. This may be termed an unpreventible accident; at least, it is one whose prevention can never be counted on or understood, so its further consideration may be disposed of. The ileum, or posterior section of the smaller intestines, being more free and floating in the abdominal cavity than any other division of the whole alimentary tube, is the most liable to become threaded, by the mere force of the horse's movements, or its own peristaltic actions, into any adventitious opening that may exist, or, suddenly by accident, present itself in the mesentery, visceral omentum, ligamentous or other peritoneal reflections. Colic, with its train of violent deportment, increases the susceptibility to this not uncommon accident.

The ileum often becomes twisted on itself into an unravellable knot, when strangulation and death ensues, hence the reason for always keeping colic patients on their legs. This gut too, by virtue of its anatomical arrangement, is occasionally strangulated by the supporting membranous stalk of a pedunculated tumour arising from its own mesentery: I had a case a few days ago, and the tumour was purely a fatty one, enclosed in a peritoneal capsuled reflection of the mesentery of the ileum. The peduncle or stalk by which the tumour was supported, and through which it received nourishment, was about seven and a half inches long, and had produced the finest strangulation that I had ever seen. The stomach and intestines are liable to perforation from pieces of coarse grass, stems or roots, and many deaths from this cause only have been reported.

The double colon, the most voluminous of the horse's intestines, is now and then the seat of impaction, and so are the single colon and the rectum from a conglomeration or conglobation (depending upon the position of the impaction), of coarse and indigestible fibrous grass (mixed with sand, stones and gravel), which has left the stomach almost as it went in: here it is relieved of what moisture it possesses, and becoming a comparatively dry mass, offering heavy physical resistance against further peristaltic action, as well as against treatment.

Inflammation, then, and the usual sequelæ soon bring about death.

The rectum is not often the seat of disease, occasionally impacted and easily relieved, if the obstruction is not located far forward.

It is sometimes ruptured by rectal manipulations to reduce strangulated scrotal hernia, and death supervenes.

Melanotic tumours, hæmorrhoids, fracture of the sacral portion of the spine, by which the tail becomes totally paralysed and always depressed, interfere with the action of voluntary fibres of the anal sphincter muscle, and therefore with the act of defecation. Recourse must here be had to clysters and removal of the fæces by the hand.

Umbilical, ventral, inguinal and scrotal herniæ, whether strangulated or not, are not due to irregularities in digestion, so will not be here considered.

Mr. F. F. Collins has supposed that paralysis of the hinder quarters of horses in India, and which now and then occurs amongst our troop horses, is due to dietetic causes.

I have dissented from this opinion, and need not discuss the subject in this essay, having given my views, *in extenso*, in the November number of the *Veterinary Journal* for 1876, page 321.

In connection with almost every *post-mortem* in which ruptured stomach is the leading feature, there is structural disease of the liver of an atrophic character, and to such an extent in some cases, as to remove one-fourth of the whole, and chiefly from the margins of the larger lobes, leaving the investing membrane all but opposed on its visceral aspects, and the more advanced in years the patient, the more extensive will be the atrophy of the incapsulated structures.

We are inclined to believe that this is chiefly due to primary enlargement depending on congestion and infiltration of the tissues with some form of exudative matter, which may be more or less completely absorbed afterwards. But it may happen that a part may be left behind, and be converted into a dense fibrous and low form of tissue—induration matter—or a cicatricial tissue, whose tendency is to contract and shrink, thus compressing and obliterating the vessels and normal structures of the part, and in this way, as well as by its pressure depriving it of its nourishment, inducing atrophy of the liver tissue in which it is deposited.

And we think that the pressure from contiguous organs that are so often flatulently or otherwise distended, may have something to say in these cases—pressure not only on the structure of the organ itself, but upon the portal vein and its tributaries.

Our experience too has led us to associate that pruriginous condition of the skin of some troop horses (and which has been termed

"prickly heat," and by some is supposed to be of a paraphytic origin, but the pathology of which is not yet decided) with cretified tuberculous disease of the liver. I have observed this in its structure and on its surfaces in several *post-mortem* examinations, but do not pretend to account for the connection: it may, of course, be simply a coincidence.

I have only seen one case of abscess in the liver of a troop horse in ten years' Indian practice, but atrophy of its substance from the existence and growth of hydated or ecchinoccic cysts, is more common. Sometimes these cysts containing a limpid fluid and its entozoa on its inner surface, are single; oftener, there are several varying in size, some attaining very large dimensions. I have seen them in most of our domesticated animals including the camel. As their size increases they arise to the surface of the liver and sometimes incite inflammation of the serous membrane, by which adhesions are formed connecting them with the parts adjacent.

The prominent part is, of course, that where least resistance is offered to the presence of the fluid within. They may exist and increase for a length of time, and be neither productive of discernible harm nor even be suspected. The last case I saw died of ruptured stomach.

The liver of the Indian troop horse is not often affected with degenerative disease. Besides the cretified tubercular degeneration referred to, the only other form that I have observed is that of a pigmentary or melanotic type in grey horses. It is described by Klebs as arising from deposition of black pigment in the portal capillaries, and in the interlobular branches of the vessel; later on in the hepatic capillaries also. The source of this pigment is believed to be the spleen where a similar change is constantly found, depending upon stagnation of blood in the sinuses, and the metamorphosis of its coloring matter. Ultimately the pigment may find its way through the liver into the hepatic venous system, and thus become distributed over the body.

From climatic cases, such as high temperatures and their extremes, chills, and the like, aided by indolence and dietetic causes, such as over-abundant feeding, giving food of an over-stimulating nature for life in high temperatures, a febrile state of the system is induced in which the liver becomes congested and inflamed. The fever is of the ordinary character, lasting some three or four days and occasionally being intermittent, with functional hepatic complications, wherein there is an icteric condition of the tissues of the body generally from retention and re-absorption of the coloring matter of the bile. We record such cases where there is fever and a yellow tinge pervading the tissues as hepatic or bilious fever. The dyed tissues may remain weeks or longer, and a horse may have acquired a good appetite long before the color has been removed, but his condition will not improve until the organ has entirely regained its healthy state.

The effete material must be eliminated from the system, for it and the deranged hepatic structure and function interfere with assimilation; the natural stimulating influence of the bile on the intestinal glands, and its glycogenetic and antiseptic functions being imperfectly performed, normal chylification, and therefore, digestion is impossible.

These are most probably the cases which terminate in atrophic disease. This fever is usually amenable to simple treatment by salines and occasional doses of calomel, proper hygienic and dietetic nursing, but it is readily aggravated by aloetic or oleaginous purgatives and depletives. But for symptoms and treatment we are not called upon in this paper.

The investing membrane of the liver too participates in an inflammatory attack as evidenced by shreds of its products lying on its surface, or stretching to some adjacent organ.

Young Walers, of all others, are most liable to this affection, particularly if worked in the sun,—too late in the morning or too early in the evening between April and October. They are unable from want of acclimatization to stand extremes of temperature at first, require careful watching for two years after landing in India, particularly if underbred, and should be well sheltered and protected from sun, heat, cold and rain, indolence, overwork, overfeeding and starvation being avoided.

The best available means to prevent the diseases under consideration have been more than hinted at in our lengthy observations on Stable Management proper in Section I. as well as in this and in reality it remains only to recapitulate, or amplify those portions of both which may be deemed of the most importance.

Adequate shelter overhead, and protection from extremes of temperature, sudden vicissitudes, draughts, drifting rain, and other climatic agencies, are objects deserving vast attention, next to the selection of a salubrious site; therefore good, lofty, deep, spacious verandahed—with roof and ridge well ventilated—well drained, untainted stables are a *sine qua non*. There must be plenty of superficial and cubic space, and nothing to interfere with inside or outside ventilation and drainage. Afford protection from solar heat and glare, mitigate the force and influence of cold draughts and hot winds, and check the worry and annoyance of stinging insects without arresting ventilation by the system of chicks referred to in No. I. Section. Cold must be specially guarded against by a sufficiency of clothing which should not be removed too early in the morning, or be left off too long towards nightfall.

Grooming exercise and sanitation and hygiene will not bear neglecting; indeed the nearer you approach perfection in all, the

better. And the greatest care and caution must be exercised in the selection of food and water, the method of preparing the grain portion, the times of administration of every part of it, solid or fluid, the quantities that should be given per diem as well as per feed, the manner in which one portion should be given in respect of the other.

Much indeed depends upon the dietetic section of Stable Management in the way of preventing and suppressing the accidents and diseases which have been treated of. Each section, however, calls for separate and special thought, yet it is essential that each one should be considered with relation to its influence or bearing on each other. Energy in one direction and laxity in another is a mere waste of time, labour, and money: it is avoiding a Scylla to fall into a Charybdis.

Stable Management, if its effects are to be approximately perfect, admits of no appreciable partiality, allows of no withdrawal of supervision, and of no substitution of duty, with impunity. There is a separate responsibility for each agent whether administrative or executive, and the removal or relaxation of the former always furnishes an excuse for shirking or like conditions in the latter.

Its course (that of Stable Management) should be almost an un-deviating one, for its laws have but little license, excepting where country, climate, and their concomitants make their own natural suggestions.

Attend to diet, hygiene, grooming, and exercise only, and neglect sanitation, and you reap a reward of some outbreak of malignant epizooty. Confine your attention to sanitation, and divorce it from feeding, &c., and then you encourage the production of colic, and its numerous fatal sequences. And so on.

Troop Stable Management in India on the whole is a very comprehensive subject, and a very practicable one in its daily routine, requiring numbers to conduct and watch its operations.

Theory is very useful, but requires the support of practice and experience to render it valuable, and this has been our aim and object throughout. We have, therefore, eschewed the deeper researches of histological physiology, deeming it prudent to leave the more profound and doubtful versions to text-book reference, employing only so much as seemed requisite to elucidate the subject in hand.

We have not discussed to any marked extent the indifferently understood actions or effects of fungi, paraphytes, parasites, bacteria, vibrios, or less popularly comprehended organism, which are found in bad samples of food and water, because we have not satisfied ourselves that there is much to fear in respect of most of them; at the same time we are far from disregarding the influences of these low forms of life in the production of disease.

There are no occult agencies like infection and contagion to contend against in suppressing and preventing the diseases and accidents of which we have been speaking, but we have on occasions observed more than ordinary obscurity hanging about the action of some of the supposed, known, and more tangible causes, that we can neither, appreciate nor reconcile with results.

Having been rather precise in the treatise on Stable Management, we appear to be merely repeating ourselves under a new heading by dictating the "best available means of preventing" this or that. Let us say that if our system be carried out *in toto*—and I see no insurmountable difficulty in the way—there is but little new matter to note on this important subject. All, then, that we have laid down in the first section as being good stable management, or conducing towards it, must be here regarded as the best preventives against the evolution and action of many causes that predispose and aid in engendering a condition in individual organs or in the system generally leading to grave, and, often times, to fatal results. It is chiefly with reference to feeding and watering that we must look for the exciting causes whose actions we wish to check, limit, or obviate. And the best available means to prevent colic and its fatal consequences—and too much stress cannot be laid upon this—is to feed regularly, frequently, and in quantities compatible with the function of digestion, and with the powers and capacity of the horses digestive organs, as well as according to work, season, climate, and other circumstances before noted, dividing both the grass and grain forage into not less than four feeds, five if possible in the hot season. Watering requires regulating and restricting where a horse is heated and fatigued, but when cool, his own discretion will be the better guide.

Water should invariably be allowed four times per diem in summer, and oftener if it be desired, and err on the safe side by watering 10 or 15 minutes before feeding. The potable condition of the water should receive marked attention, and brackishness and all physical impurities should be avoided.

The grain should be of the best quality procurable, clean, sound old, unaffected by climate, storing, climate, fungus, and insect. Except on emergencies one kind of grain should not be given, but consist of two kinds—that is, a mixed diet. Each to be well prepared separately by crushing, and afterwards proportioned by quarters, halves, or thirds, the preponderating grain being alternated by way of change and variety to suit existing characters of climate and the quality and quantity of work. In the cold season, the regular administration of bran should be either entirely suspended or reduced, unless there is a cessation of all work excepting the exercise of watering order. Bran is a useful adjunctive in the hot season, in times of indolence and sickness, in convalescence and in cases of obesity, when the article is pure, but we are not in favour of using that generally issued by

the Indian Commissariat Department. It is often a mixture of sweepings, and barley, and rice husks.

A mixed grain forage always suits the horse's system best, and for the reasons advanced in Section I.

Avoid voracity, gorging, and over-drinking, or prevent these inclinations wherever they lie; regulate the quality and quantity of food and water, increase the times of giving them, and thus decrease their bulk. Prepare the grain; dry the grass well; clean it thoroughly of sand, dirt and indigestible roots, stems and rank specimens; put a stop to inordinate air-swallowing habits of "cribbiting" and "windsucking"—a difficult task in most Indian stables—by removing objects that are seizable with the teeth. The usual strap for preventing these habits is an instrument of torture, and its influence is quite as bad as that which it is supposed to cure.

Avoid chills, draughts, and sudden changes, and carry out the above rules, and we venture to affirm that colic, and the death percentages from accidents and diseases that supervene on it, will be reduced to a minimum, but never be entirely prevented until we know more of its causes, their precise nature and actions.

Strong exercise after feeding and drinking is specially to be avoided. Horses should be thoroughly dried and groomed before being fed, and not be allowed to dry with uncovered bodies whilst feeding. Now this may often be seen in troop stables: always stop it. A cold, or indeed any kind of wind acting on a skin whose hair is saturated with moisture, will act prejudicially, as we have explained, and aid in producing colic and fever.

Feeding should be the very last act in the routine of the stable hour; horses should be left undisturbed at this time, quiet being conducive to proper mastication, insalivation, &c.; less grain will be thrown about; there will be less voracity and liability to digestive irregularity when their attention is not distracted by grooming, or by people moving about. It is a custom in some troop stables to rub the horse's legs whilst feeding, but it is not a good practice.

Warmth must not be neglected; horses require it more in India in winter than they do in England, because the stables are open all round, and some horses have no stables at all. What is likely to result from exposure to a strong sun from nine till four, as we get in the cold season (with a keen piercing wind blowing at the same time), and then exposure the rest of the twenty-four hours to cold which brings the mercury down to freezing point? We should ask, what might we not expect? Examine the Schneiderian membrane on the cold mornings, and you will see them deeply congested, dark, and livid, which more or less disappears on the air becoming warm. Resulting as it does from an external cause, it is indicative of only a local condition.

this part of the respiratory tract is so situated as to meet with the coldest air, and to feel its most intense influence; and this circumstance has led to error (though on the right side) in the matter of isolating sound troop horses shortly after the prevalence of glanders and farcy.

Colic cases should never be neglected for a minute; reports should be made at once, and assistance sought for and afforded without delay, as it is so very important to check abdominal pain as early as possible and I would again impress it on the memory that the patient must be kept on his feet, to prevent rolling, struggling, and the assumption of unnatural and dangerous postures; for it is most likely during these times that ruptures, twists, and strangulations (excepting inguinal and scrotal) occur.

Albeit we are practically aware of the difficulty of preventing a horse from lying down or throwing himself down when in abdominal pain, so heedless is he of himself, it should, however, be vigorously and continuously persisted in by running his head-rope over a beam or through a ring higher than his brow, easing the purchase or tightening it as circumstances dictate.

Of these means and of slinging horses at these times I have before spoken.

It is yet an undecided point whether medicine should be given in the solid or fluid form, in colic. I think, however, no rigid law can be laid down until we are clever enough to discover individual etiology the cause requires removing: this may be successfully effected by an ammoniacal or other stimulant, or by an opiate or anodyne, nineteen times out of twenty; but the twentieth case, having, so far as we can see precisely the same character, may foil any method of treatment.

And as we act more or less in the dark in the treatment of such cases, so much the more should we strive to prevent the occurrence of what we cannot always undertake to cure.

To the attainment of this end our endeavours have hitherto, and in these papers been directed, and we hope that, however imperfectly rendered, our efforts may not prove abortive.

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